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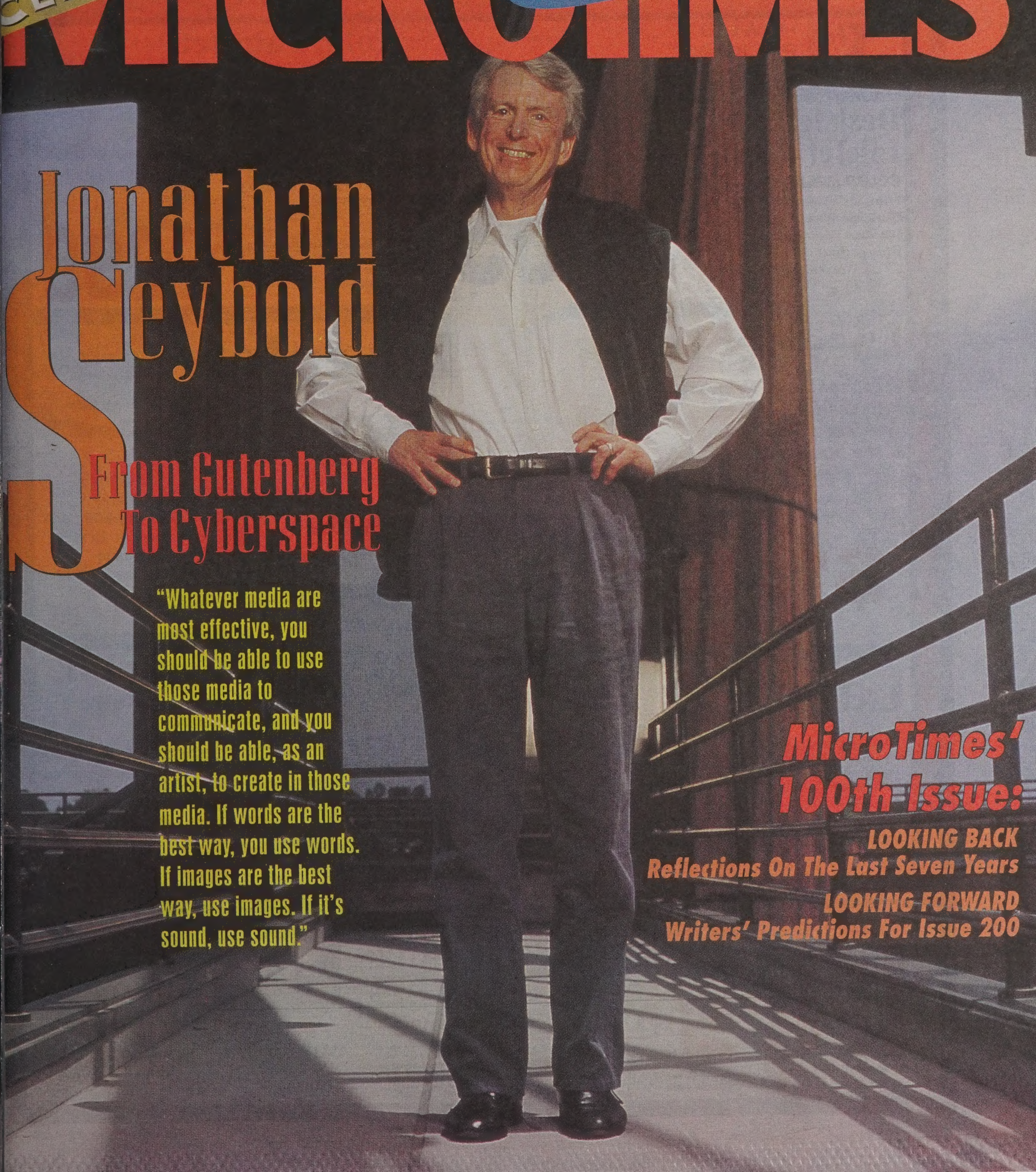

Jonathan Seybold

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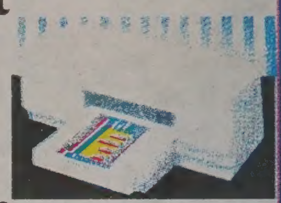

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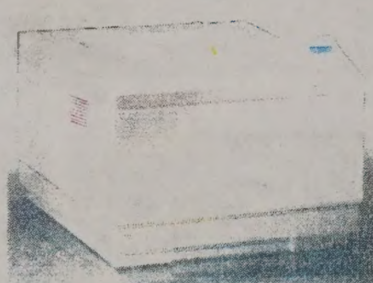

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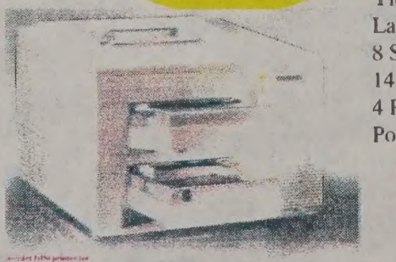

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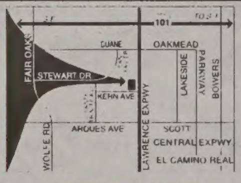
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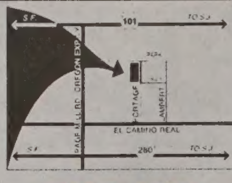
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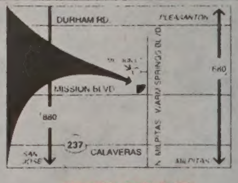
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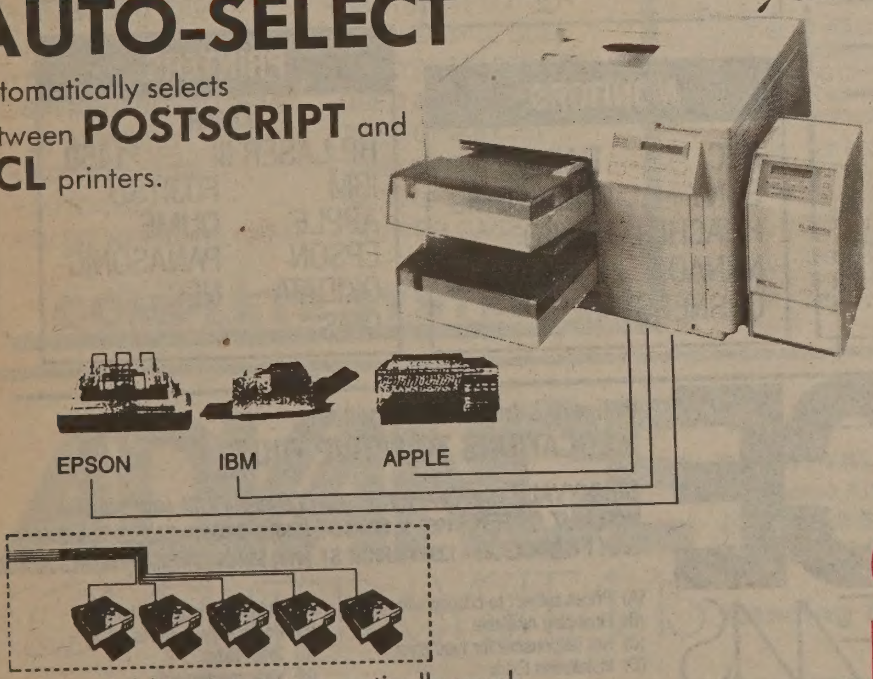

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SEPT. 28, 1992 ISSUE #100
MICROTIMES

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A NOTE FROM THE EDITORS

Back in 1984 when we launched this magazine, much of what we're covering now was still pretty much the domain of science fiction. We've been fascinated with the unfolding of technological possibilities—and the real, practical tools people turn them into.

It is eminently fitting, we think, that Jonathan Seybold is the cover subject for our hundredth issue. For one thing, the computer-based publishing revolution in which he continues to play such a significant role has had a profound effect on the industry at large—and also on us. For longer than we'd care to admit, we produced this magazine the old-fashioned way—with typewriters and galleys and wax and X-Acto knives…and then the Macs came. Like the rest of the world, we've never looked back.

Starting on page 125, our writers, in their usual imaginative fashion, muse on the future, and where we'll all be when Issue #200 comes around. In seven years or so, we'll see how accurate they were.

Thanks for coming along with us as we proceed down this virtual road. We hope we continue to deserve your interest and support.

—*ME*

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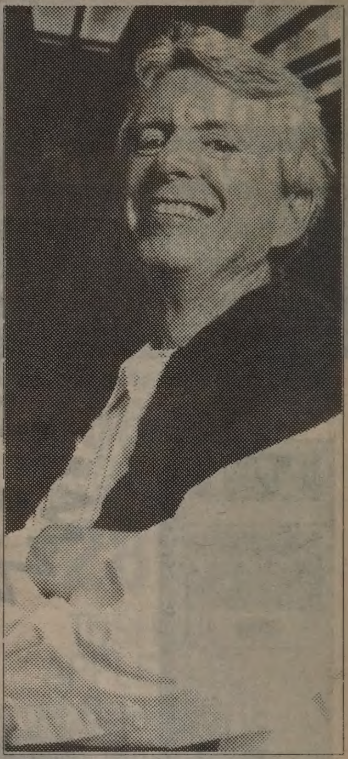

By this time, desktop publishing is pretty much a household word. But, as this interview suggests, it's only the tip of the digital media iceberg, and only a hint of the profound changes to come in the way information is presented, bought, and sold.

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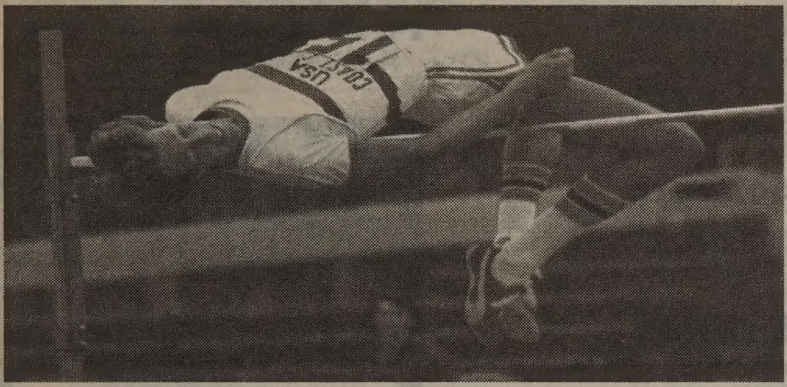

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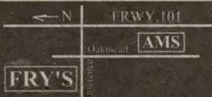

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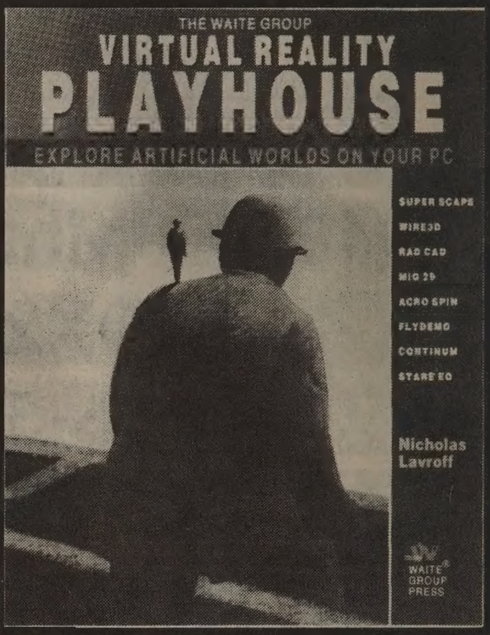

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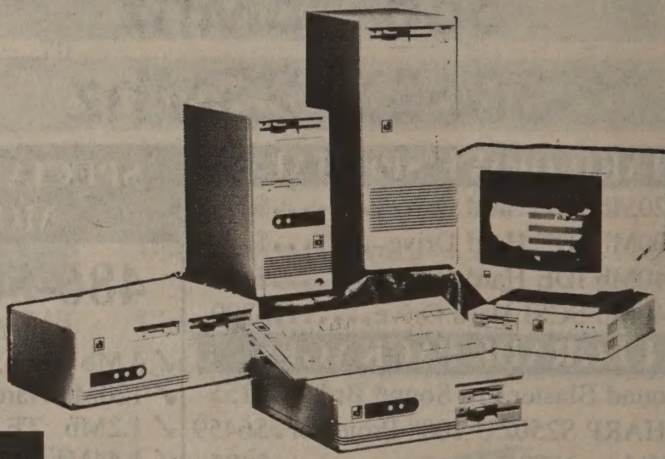

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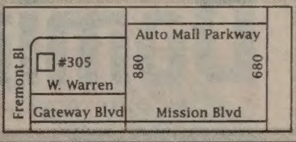

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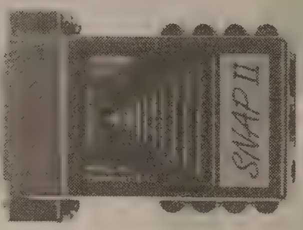

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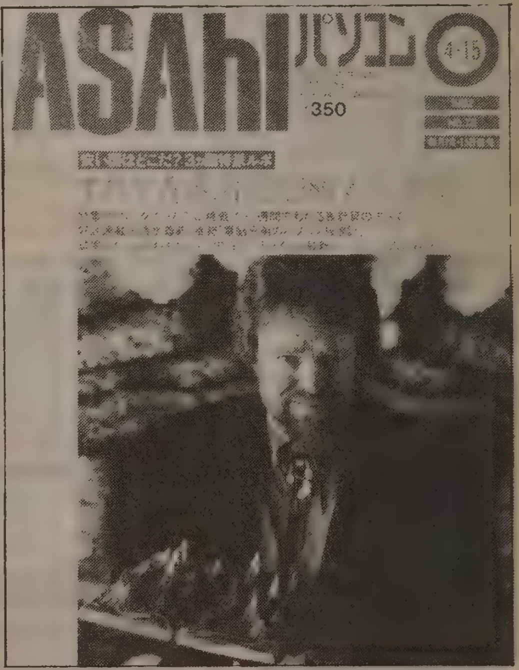
This month's cover turned out to be quite a production in computer-based publishing.

The photo itself was taken (with a Hasselblad) by Los Angeles photographer Ann Summa, who has done many excellent covers for us over the years but outdid herself on this one.

The image was scanned by Barneyscan of San Leandro on a Barneyscan 4520; composite negatives were then output on a Linotronic 330 by Image Setters of Pleasanton. The cover design is the work of Lee Ann Nelson, of Nelson Design.

For our 100th issue, we welcome back some of our writers who haven't appeared for a few months (or, in some cases, even longer!). Among them:

John Perry Barlow cofounded the Electronic Frontier Foundation, writes lyrics for the Grateful Dead, and is a contributing editor for *MicroTimes, NeXTWORLD*, and *Communications of the ACM*.



Barlow on the cover of Japan's *Asahi Pasokon* magazine.

Mikael Blaisdell is a consultant and customer support specialist in the Bay Area.

Adam Gaffin is a writer for the *Middlesex News* in Framingham, MA.

Fred Lieberman teaches in the music department of the University of California at Santa Cruz, and is coauthor (with Mickey Hart) of *Planet Drum*.

Brock N. Meeks is based in the Washington, DC area and writes for *Communications Daily*.

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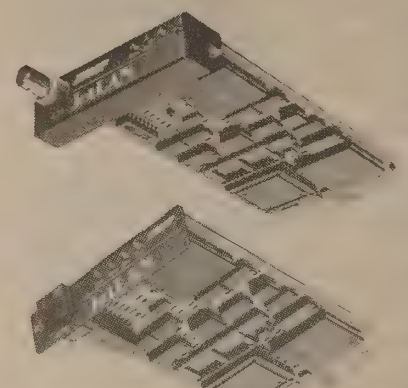

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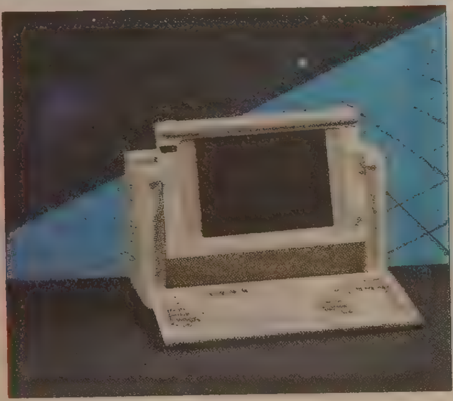

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MICROWAVED BRAINS?

I disagree with the implication in your "Working Without A Wire—Outdoors" article (Issue 98N/99S) that microwave communications is a safe medium.

A power level of 65 milliwatts is mentioned as typical for a microwave signal, and is described as being "well under established safety standards."

I am unclear as to what standards are being referred to, as the American National Standards Institute (ANSI) standard is only *one* milliwatt (1,000 microwatts) per square centimeter.

Microwave power levels of 100 milliwatts have been shown under experimental conditions to cause death in laboratory animals after about an hour of exposure, and a wide range of potentially carcinogenic physiological changes have been observed at much lower levels.

Incidentally, cellular telephones operate at frequencies approaching the microwave spectrum, so each time you hold one of those things to your head you are literally microwaving your brains.

John Lankes
San Francisco

We suspect that as wireless technology becomes more widespread, the debate over the medium's safety will make the one over monitor radiation pale by comparison. We also suspect that there will be much research and more argument before there is much in the way of consensus.

—eds.

ANOTHER VIEW OF WORDFINDER PLUS

Matthew Leeds' review of Word Finder Plus by Microlytics (#98) is informative, but I'd like to clarify my experience with it on a couple of points.

I use Word Finder Plus with Word 5.0 and find it very satisfactory. Mr. Leeds stated that "in Word 5 the hot key was not functional." Very strange. I've never had any problem. I utilize the QuicKeys program extensively, and realized that I already had WF's default hot key in use—I changed it after trying various combinations until I found one that did not interfere with any of my other QK functions. Everything I tried did work OK.

In my system I routinely keep twenty Inits active. Mr. Leeds said he had a problem there as well. Probably I'm lucky—all my Inits are compatible with WF Plus.

Yes, Word Finder Plus is active continuously until it's turned off in the control panel. This is one fault that Microlytics should correct, although it does not present a "problem" for me. In SuperPaint I use WF Plus sometimes to check my text for a word that escapes me or to double check the spelling of a word—however, it is only functional in this program as a "reference," not as a "replacement" of words. It also performs well in Panorama and FoxBASE+/Mac, and is excellent with White Knight.

If I had read this review *before* I decided to buy Word Finder Plus, I might not have purchased it, fearing that perhaps it would not function harmoniously with my programs. (Inits not included—any of them can be troublesome periodically.) Though it does lack many words that I'd like to see included, overall my opinion is that WF Plus is a worth-your-money purchase.

Cyrus Gordon
Oakland

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INDUSTRY INSIGHT

Affordable Multimedia From Tandy, Affordable Photos On Disc From Kodak

BY PAUL HOFFMAN

TANDY INTRODUCES LOW-COST MULTIMEDIA PC

A new home computer, dubbed "Sensation!," will be available soon at your local Radio Shack. In a bold attempt to capture the multimedia PC market, Tandy is pricing the new computer at $2000 (without monitor), half the price of many of the current competitors. The computer will even act as a fax and answering machine. Sensation! will come with a full complement of software and hardware, and should be the computer that will either prove or disprove the public's interest in multimedia.

The computer comes with all the software you need for multimedia: MS-DOS 5, Widows 3.1, Microsoft Works for Windows (an all-in-one package that includes a word processor and simple database), Microsoft Bookshelf for Windows (which includes an encyclopedia, dictionary, thesaurus, and so on), and communications software for Prodigy, America Online, and Sierra Network. One of the funniest parts of the Sensation! announcement is that Tandy is also including a package called WinMate which "makes Windows easier to use." For all of the hype on how easy Windows is, it's become clear that Windows is only easy if you already know what it is you are trying to do. WinMate segregates all of the Windows features into single-button choices and hides most of the standard Windows features like Paintbrush and Write from the average user.

Copyright © 1992 by Paul Hoffman. All rights reserved. Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on Internet (phoffman @well) or CompuServe (71545,346)". He also writes popular microcomputer books.

Sensation!'s hardware will impress even seasoned PC users: a 25MHz 486SX CPU, 107MB hard disk, 4MB of RAM, a fast CD-ROM reader, and a 2400 baud fax/modem. Similar systems with only MS-DOS often cost $2500, so Tandy's move will probably force competitors to drop prices quickly to prevent people from going to Tandy just for the hardware. The system uses a fairly standard PC base so that it is easy to upgrade the RAM and add additional cards. A popular option will be the PC/TV board, a cable-ready board that turns the display into a TV.

Someone buying a Sensation! system as a first computer will probably not need to buy anything else for many years. Of course, they will probably want to buy additional multimedia titles, but many people will be happy with Microsoft Bookshelf for the pizzazz and Works for traditional things like word processing and checkbook balancing. Tandy can offer Sensation! to the office worker who wants to set up a part-time business at home or to parents who want their daughter or son to have a computer for school. If other related products like PhotoCD (see below) catch on, Tandy could lure in many people who had up to now stayed away due to Tandy's "hobbyist" image.

Many people are predicting that Sensation! will be the computer that proves multimedia can work. That will depend on how well Tandy sells and advertises the system. Advertising and convenience are Tandy's strong points: on-site sales and after-sale support are its weakest. Because of a high turnover in sales staff, Tandy will have to pay more attention to how Sensation! is presented in its stores. If their advertising is good enough, people will walk in ready to buy. However, if Tandy is relying on its store staff to sell the computer, the multimedia industry had better not bet on Sensation! to be its savior.

KODAK PHOTOCD COMES TO DESKTOPS AND TELEVISIONS

If you bought an expensive color scanner so you could input photographs to your computer, you may regret your decision soon. Kodak is about to greatly expand its PhotoCD services, and will make getting images into your computer as easy as going to the local photo processor. The quality of the resulting pictures will be incredibly better than that of scanned pictures, and you can also view the results on your home television at very low cost.

The basic idea of PhotoCD is that you can bring slides into a local photofinisher and walk out with a CD-ROM disc with those slide images on them. The quality of the slide images is phenomenally better than what you get from standard 600dpi color scanners that cost over $1000. You can read images from the PhotoCD into your computer using a CD-ROM XA drive using software from Kodak or other manufacturers. You can also view the

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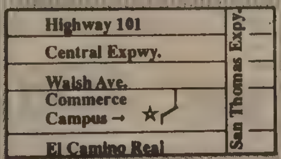

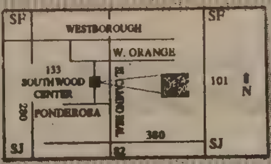

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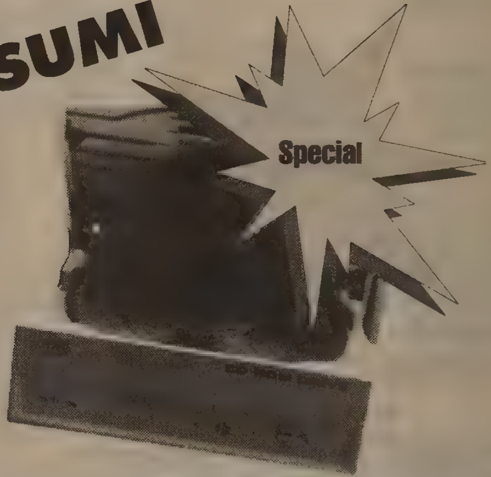

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Kodak hasn't stopped at just making the discs. It has started releasing software to make accessing the disks easy for both amateurs and professionals. For example, the first package is the low-end PhotoCD Access software for PCs running Windows and Macintosh. It allows you to browse a disc and convert images into PICT, TIFF, EPS, and other formats. It costs $40, but will probably be bundled with other software and even with CD-ROM players. Kodak will release more powerful photo software such as retouching software, photo organizers, and so on, although many of these facilities are already available from other vendors.

PhotoCD could be as revolutionary as instant photography was when Polaroid introduced it. It can be used by amateurs and professionals; it is convenient and portable; it makes viewing photos easier. Kodak has already proven that it understands the flexibility of the computer market by introducing alternative, upward-compatible PhotoCD formats that can be viewed on home PhotoCD systems. For example, PhotoCD Portfolio discs can have both high-resolution and low (television) resolution photos on the same disc. You can also incorporate text, graphics, and sound with the photos. Such a disc can hold up to eight hundred low-resolution photos, making them ideal for catalogs. In fact, LL Bean has already signed on to the technology, which will be delivered next year.

Within a few years, photographers will be able to edit, distribute, and even copy-protect slides from their desktops, delivering the results to clients over phone lines. Business presentations that now rely on primitive clip art and graphics will increasingly use photographs, and home photo viewing will radically change with the new medium. Instead of searching through boxes of photos and fumbling with slides, you can simply pop in a disc and fast forward to a particular image. And, if you happen to have a CD-ROM drive in your home PC, you can alter that image, print out copies, and so on, with less effort than it takes to use a word processor.

WINDOWS FOR WORKGROUPS: MICROSOFT SLIPS INTO LOW-END NETWORKING

The networking market has been stymied by hard-to-understand and expensive software. Novell tried to crack into the lower end with Netware Lite, but had a vested interest in not cannibalizing its obvious profit center. Microsoft's LAN Manager, on the other hand, has never made Microsoft much money, so it has almost nothing to lose by coming out with a cheap, low-end solution. However, most users still think of "networking" as difficult, so Microsoft had to come up with a new marketing strategy. In a few months, you will see the result: Windows for Workgroups.

Basically, Windows for Workgroups is Windows 3.1 with low-end networking lashed in. The actual extensions to Windows are almost trivial: multiuser appointment calendar and Clipboard, networked DDE, and a slightly better File Manager. Windows for

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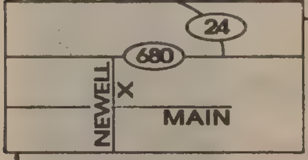

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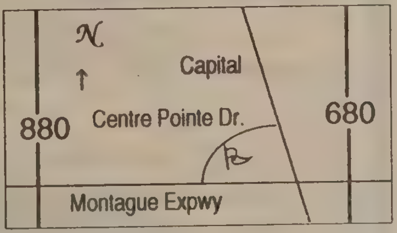

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Workgroups is really a way for Microsoft to sell networking to the millions of small groups of people who want to network but don't want the hassle of Novell or its competitors. By wrapping the network into an already-successful product like Windows, Microsoft gets around the perceptions that networks are hard to use or manage. Instead of calling it "Small Network With Windows," Microsoft is packaging it as "Windows for People Without a Network." The computers on the network don't even have to run Windows.

Novell should be worried. Regardless of how much Microsoft chooses to charge for Windows for Workgroups, the marketing will sway many potential customers away from Novell. Further, Microsoft is redefining who runs a network, just as Apple did among Macintosh users five years ago. Instead of requiring a "server" and a "network administrator," Windows for Workgroups simply requires that one PC run the main software. Setting up Windows for Workgroups is infinitely easier than setting up even the simplest of Novell networks.

Many corporate MIS directors should be worried as well. Centralized control is much more difficult if there are gangs of people who don't participate in the company network or fall under its rules. Of course, this has always been a threat to MIS departments, but the threat has never come from such a well-respected company like Microsoft. And, since the product doesn't say "network" in the name, someone could probably buy it out of discretionary funds without raising any eyebrows.

There is no question that multiuser features in Windows for Workgroups should have been in Windows 3.1: you should not have to pay extra for features like network DDE and workgroup calendars. Remember, Windows 3.1 already works on networks. The value of Windows for Workgroups is in the networking, not in its Windows extensions.

Workgroups is really a way for Microsoft to sell networking to the millions of small groups of people who want to network but don't want the hassle of Novell or its competitors.

To be sure, the networking is a great value. As Macintosh users have known for years, there is nothing like a network that's easy to set up and maintain. Although Windows for Workgroups will probably be much harder to configure than a TOPS network, it will clearly save dozens of hours over a Novell network for a small group.

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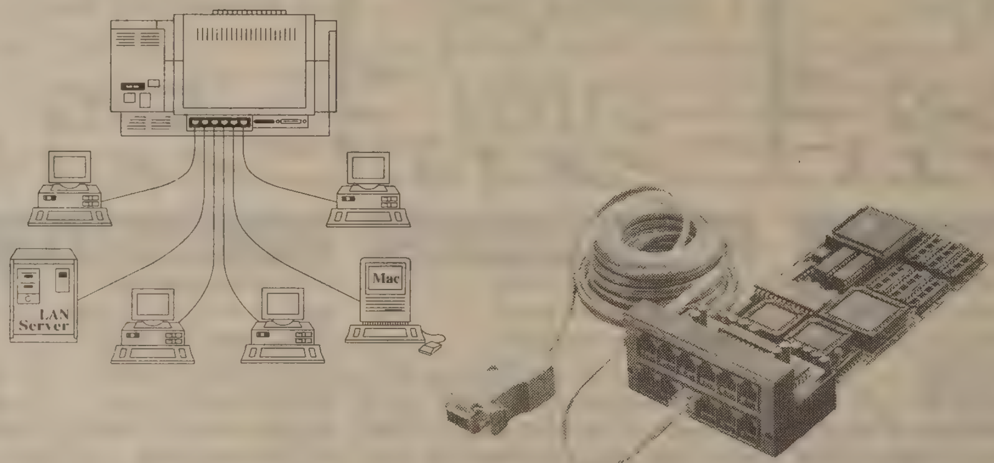

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ComputerLand
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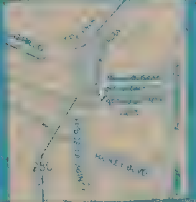

Technology Stocks Get Caught In Global Selling Storm

As stocks in Tokyo spiraled downward to six-year lows and London-based issues plummeted to eighteen-month lows, stocks nationally felt the stinging effects of such international selling pressure during the monthlong trading session ended August 28.

Specifically, the Dow Jones Industrial Average dropped 126.17 points, or 3.72 % for the period, to close at 3393.78.

Technology issues got caught up in the selling pressure as well last month, as the MicroTimes Stock Index cascaded 168.71 points, or 5 % during the term, before bottoming out at 3198.48. Losers in our financial barometer outpaced gainers by a 23-to-9 count, while six issues fell to new 52-week lows versus three stocks that sprinted to 52-week highs.

Hewlett-Packard was the hardest hit in our portfolio last month, as the computer maker witnessed its stock price plunge 24.15 % — a $17.75-per-share loss for the period. Midway through August, the company reported disappointing third-quarter earnings of 76 cents a share, which fell in at the low end of the company's previous estimates, and merely matching the earnings made in the year-ago quarter. The stagnant earnings news, as a result, sent the stock plummeting. Hewlett-Packard, not surprisingly, was our index's largest dollar and percentage loser for the month. Shares closed at $55.75.

Falling close behind Hewlett-Packard was Adobe. Analysts pounded the company last month, after predicting flat third-quarter printer royalties, higher than-expected expenses, and higher development costs. Lehman Brothers cut its 1992 fiscal year-end earnings estimate for the company by 28 cents a share to $2.27 a share. As a result, Adobe's stock crumbled $5 a share, or 13.16 %, before settling in at its new 52-week low of $33.

On a brighter note, Autodesk bucked the downward selling pressure, advancing 7.06 percent, or $3 a share, to take the largest dollar gainer honors of the lot. Salomon Brothers began its coverage of the company last month with a "buy" recommendation. Separately, Autodesk reported second-quarter earnings of 43 cents a share on a charge against earnings, versus 65 cents a share earned a year ago. Autodesk's stock concluded the monthlong trading session at $45.50.

In other news, Dell Computer reported second-quarter earnings of 57 cents a share—a 23-cent-per-share improvement over earnings made a year earlier. Dell's CEO predicted third-quarter earnings will at least match second-quarter levels. For the month, Dell's stock rose $1.88 a share, or 8.15 %, and was the largest percentage gainer in our index. Shares closed at $24.88.■

EXCH	COMPANY	TICKER SYMBOL	CLOSING PRICE 07/31/92	CLOSING PRICE 08/28/92	NET CHANGE IN MONTH	PERCENT CHANGE IN MONTH	P/E RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
	SOFTWARE										
OTC	Adobe (L)	ADBE	38.00	33.00	-5.00	-13.16	14	0.32	0.97	68.50	33.00
OTC	Aldus	ALDC	14.63	12.00	-2.63	-17.95	13	0.00	0.00	45.00	11.50
OTC	Autodesk	ACAD	42.50	45.50	3.00	7.06	25	0.48	1.05	52.00	23.25
OTC	Borland	BORL	47.75	40.25	-7.50	-15.71	–	0.00	0.00	86.75	35.00
OTC	Informix (H)	IFMX	37.75	37.50	-0.25	-0.66	17	0.00	0.00	39.75	6.00
OTC	Lotus	LOTS	18.25	16.25	-2.00	-10.96	11	0.00	0.00	39.75	15.50
OTC	Microsoft	MSFT	72.75	74.38	1.63	2.23	31	0.00	0.00	88.84	53.34
OTC	Novell	NOVL	55.00	50.25	-4.75	-8.64	33	0.00	0.00	65.00	31.75
OTC	Oracle	ORCL	18.63	17.38	-1.25	-6.71	39	0.00	0.00	21.13	10.25
OTC	Software Publishing	SPCO	9.50	10.00	0.50	5.26	–	0.00	0.00	26.25	7.50
OTC	Symantec (L)	SYMC	21.00	17.00	-4.00	-19.05	18	0.00	0.00	51.00	15.50
	HARDWARE										
OTC	Apple	AAPL	46.75	45.00	-1.75	-3.74	11	0.48	1.07	70.00	42.75
OTC	AST Research (L)	ASTA	13.88	12.25	-1.63	-11.71	6	0.00	0.00	32.25	11.25
NYS	Commodore (L)	CBU	9.63	7.50	-2.13	-22.08	9	0.00	0.00	19.25	6.75
NYS	Compaq	CPQ	29.50	30.63	1.13	3.81	37	0.00	0.00	36.75	22.13
NYS	Digital Equipment	DEC	39.25	36.63	-2.63	-6.69	–	0.00	0.00	65.50	33.25
OTC	Dell	DELL	23.00	24.88	1.88	8.15	13	0.00	0.00	29.00	13.91
NYS	Hewlett-Packard	HWP	73.50	55.75	-17.75	-24.15	15	0.80	1.43	85.00	44.63
NYS	IBM	IBM	94.75	87.25	-7.50	-7.92	11	4.84	5.55	106.38	81.63
NYS	Silicon Graphics	SGI	22.25	21.88	-0.38	-1.69	–	0.00	0.00	29.75	14.13
OTC	Sun Microsystems	SUNW	26.75	26.63	-0.13	-0.47	16	0.00	0.00	35.88	20.75
NYS	Xerox	XRX	74.75	74.88	0.13	0.17	19	3.00	4.01	82.25	52.63
NYS	Tandy (L)	TAN	24.75	23.88	-0.88	-3.54	11	0.60	2.51	31.25	22.25
	CPU'S										
NYS	Advanced Micro Devices	AMD	8.88	9.50	0.63	7.04	4	0.00	0.00	21.50	7.38
OTC	Intel	INTC	59.75	57.75	-2.00	-3.35	16	0.00	0.00	68.75	38.50
NYS	LSI Logic (L)	LSI	5.88	5.38	-0.50	-8.51	–	0.00	0.00	9.88	4.88
NYS	Motorola (H)	MOT	85.63	85.88	0.25	0.29	23	0.76	0.89	88.13	54.00
	COMMUNICATIONS										
NYS	AT&T	T	43.88	42.25	-1.63	-3.70	90	1.32	3.12	44.88	32.88
NYS	BellSouth Corp. (H)	BLS	52.75	53.50	0.75	1.42	16	2.76	5.16	55.50	43.38
OTC	MCI	MCIC	33.75	32.63	-1.13	-3.33	16	0.10	0.31	36.13	25.25
NYS	Northern Telecom	NT	34.88	34.25	-0.63	-1.79	18	0.36	1.05	49.25	33.75
NYS	Pacific Telesis	PAC	43.63	43.50	-0.13	-0.29	16	2.16	4.97	45.00	36.88

KEY: NYS = NEW YORK ASE = AMERICAN OTC = OVER THE COUNTER
(H) = NEW HIGH REACHED IN PERIOD (L) = NEW LOW REACHED IN PERIOD

MARKET DIARY:

ADVANCES....................	9
DECLINES....................	23
UNCHANGED................	0
NEW HIGHS..................	3
NEW LOWS...................	6

MOST ACTIVE ISSUES:

LARGEST DOLLAR GAINER........................	Autodesk.................................... $	3.00
LARGEST DOLLAR LOSER..........................	Hewlett-Packard........................ $	-17.75
LARGEST PERCENTAGE GAINER...............	Dell..	8.15 %
LARGEST PERCENTAGE LOSER.................	Hewlett-Packard.........................	-24.15 %

	CLOSE 07/31/92	CLOSE 08/28/92	NET CHANGE IN MONTH	PERCENT CHANGE IN MONTH
MICROTIMES STOCK INDEX	3367.19	3198.48	-168.71	-5.01
DOW JONES INDUSTRIAL AVERAGE	3393.78	3267.61	-126.17	-3.72
STANDARD & POOR'S 500 STOCK INDE	424.21	414.84	-9.37	-2.21
N.Y.S.E. COMPOSITE	233.15	228.43	-4.72	-2.02
NASDAQ COMPOSITE	580.83	563.56	-17.27	-2.97

CLOSING QUOTES FOR GRAPH		
DATE	MICRO TIMES	DOW JONES
02/14/92	3984.10	3245.97
03/13/92	3888.19	3235.91
04/10/92	3566.89	3255.37
05/08/92	3642.36	3369.41
06/05/92	3562.74	3398.69
07/02/92	3182.43	3330.29
07/31/92	3367.19	3393.78
08/28/92	3198.48	3267.61

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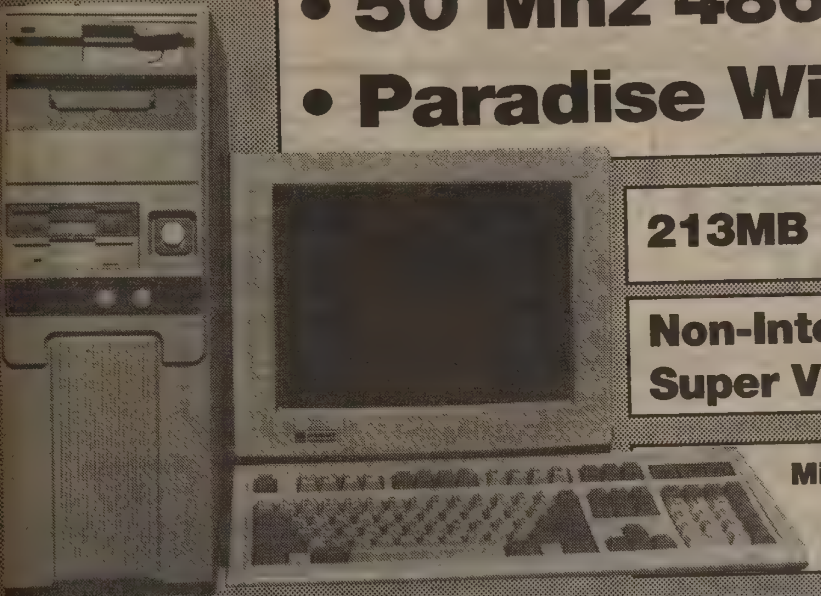
Uncle Ralph's 486-50

Windows Accelerator System

- **50 Mhz 486 w/upgradable CPU**
- **Paradise Windows Accelerator**



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8MB RAM

Non-Interlaced Super VGA Monitor

256k Static RAM Cache

Microsoft Windows 3.1 and DOS 5.0 with Manuals

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Here's What Is Included...

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You'll be amazed at how fast your Windows applications will run with this new Accelerator card. Even your most sluggish programs will fly.

Low Radiation Super VGA Monitor
This excellent monitor is "non-interlaced" for flicker free performance, and has a sharp .28 dot pitch and 1024x768 resolution for remarkable detail. Its' deep blacks and vivid colors make it a real stand out.

8MB RAM
Many systems are advertised with only four, or even one megabyte of RAM, but this one comes standard with eight. The extra memory makes a big difference in the way your applications run.

213MB Caching Hard Drive
Our hard drives are very fast, and so quiet that you'll have to put your ear to the computer to hear it ... which will make your office a nicer place to work in.

Fully Configured
The system includes serial, parallel, and game ports. All necessary cables, and a quiet power supply. It also includes DOS and Windows which come with manuals and can be registered for support and upgrades.

FCC Certified
You won't have to worry about causing interference with other peoples TV and radio reception.

Money Back Satisfaction Guarantee
If you don't think that this computer is the greatest thing since sliced toast you can bring it back for a full refund without a restocking fee. Complete details of our generous refund and exchange policy are printed on every invoice.

Same Day Repair Service
We expect you'll never have a problem with your Uncle Ralph's computer, but if you do, we'll fix it the same day (or by the next morning if you bring it in late in the day), or we'll give you a loaner.

Lifetime Warranty on Labor

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The motherboard is the heart of every computer system, and this may be the finest one ever designed. It has a true 50MHz CPU that's designed to be upgraded to 66 or 100 MHz.

Easily Upgraded When Faster CPU's are Available
This system is a rocket by today's standards, and it will be a rocket by tomorrow's standards too because it's already designed to accept Intel's next generation of super high speed 486 CPU's.

256k Static RAM Cache Expandable to 512k
A machine that's this fast needs a big cache of fast SRAM to maximize performance and eliminate "wait-states". We use 256k of superfast 15ns SRAM while others use smaller caches of slower 25ns SRAM.

Full Surface Mount Technology
Surface mount technology eliminates the most common causes of motherboard failure by pressing chips into place instead of just soldering them. It's an expensive construction technique that's worth the investment if you can't afford downtime.

6 Layer Motherboard with Wide Circuit Traces
Our motherboard runs cooler, dissipates heat faster, and is more reliable than boards that use fewer layers or thinner circuit traces. This is especially important with today's hot running 50MHz CPU.

OPTI Chipset
We use the OPTI Chipset, knowing that OPTI has been the first choice of high end motherboard designers for years.

AMI Flex BIOS
The AMI Flex BIOS can be upgraded with floppy disks so you can keep your computer compatible with technologies that haven't even been invented yet.

Dallas Smart Clock/Battery
Most computer batteries have a short life and cause your computer to lose a lot of time. Our smart clock/battery won't need replacement for at least five years and is super accurate.

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Is the system FCC B Certified so you don't have to worry about interfering with your neighbors' TV and radio reception?
How long will you have to wait if your computer needs service? Will you have to wait for parts?
Is the system you want to purchase available immediately or will you have to wait for it to be assembled?
If a deposit is required, is it refundable?
Is the store's satisfaction and refund policy in writing? Is there a restocking fee?
Are you getting legal copies of DOS and Windows, or is there an extra charge for manuals?
Is there an extra charge for features which most stores include free?
Is there an extra charge for credit card purchases?

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Super VGA, 1024 x 768
Resolution, .39 Dot Pitch
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- DOS & More

A super fast SX at a terrific price. Comes in a space saving case. FCC B approved.

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All of our computers include a written money back satisfaction guarantee. Except for special ordered parts, there are no restocking fees.

All of our systems are FCC Certified so you won't have to worry about interferring with your neighbor's reception.

All software includes manuals and can be registered for manufacturer's support.

Our 386 and 486 systems include a sharp .28 dot pitch SVGA monitor. Less expensive monitors are available.

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If one of our computers needs service and we can't have it ready the same day, we'll give you a loaner (unless you bring it in really late in the day).

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- AMI Upgradeable Bios
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Power

486-50

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- Hi-Definition Super VGA Monitor
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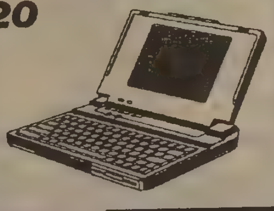
Mitac 386-SX20 Notebook



- 60 MB Hard Drive
- 2 MB RAM
- VGA Screen

BONUS: Carrying case and Logitech Trackball. ***$179 value***

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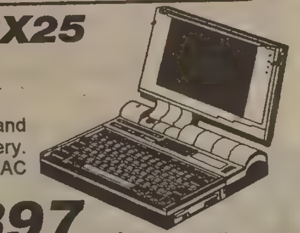
Chaplet 386-SX25



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- 2 MB RAM

60 MB hard drive, VGA screen and weighs only 6.6 lbs. with battery. Includes MS-DOS, and external AC power adaptor.

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Very small & lightweight ink jet printer that runs on battery or AC.

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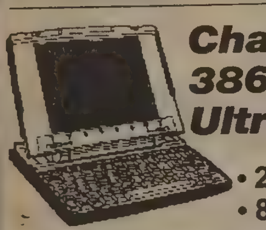
Chaplet 386 SXL-25 Ultra Slim



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- 80 MB Hard Drive
- Built-In Trackball
- Only 5.5 Lbs.

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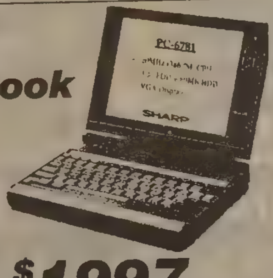
386SL20 Notebook



- 2 MB RAM
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- 16K Static RAM Cache
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- Built-In Trackball
- Only 4.9 Lbs.

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We pre-screen everything we sell for compatibility & reliability. We know how much you hate it when your equipment is in the shop and we want to keep you happy.

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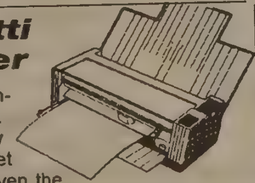
Star 24 Pin Letter Quality Printer **$197**

Royal/Olivetti Inkjet Printer

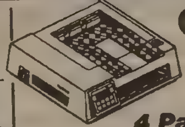


Here's the newest technology in Inkjet Printers. It takes up only a tiny space on your desktop, yet has output that rivals even the best laser printers.

With Cutsheet Feeder **$397**

OKIDATA

Laser Printer



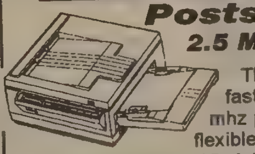
4 Page Per Minute

This 300 dot per inch laser printer has crisp blacks and publication quality output. HP Series II compatible, with standard typefaces/fonts and a slim, low-profile design. 5 Year Warranty

$627 $32 Month

EVEREX

Postscript 2.5 MB RAM

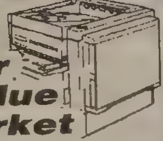


This printer is fast, with a 25 mhz processor, flexible and simple to use. Bundled with 35 Adobe compatible postscript fonts, 2.5 MB RAM, and prints at 6 pages per minute.

$1247 $62 Month

brother

Best Laser Printer Value on the Market



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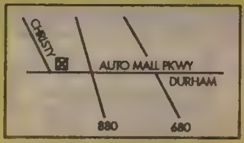
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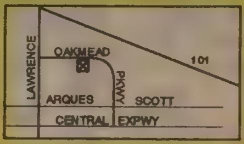
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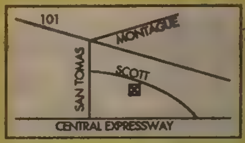
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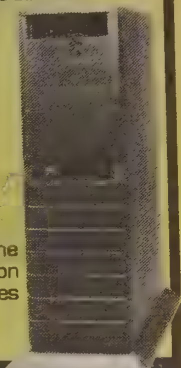

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Access To Public Records

BY JIM WARREN

REALIZABLE FANTASIES

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Warren founded InfoWorld, *the DataCast proposal for paperless electronic newspapers, Wireless Digital, Initiative, Inc., and one of the nation's largest public microcomputer conventions. He was founding host of PBS's* Computer Chronicles, *founding editor of* Dr. Dobb's Journal, *and has chaired various trade and professionals' organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics & statistics, and once chaired the College of Notre Dame-Belmont Mathematics Dept.*

He organized and chaired the landmark First Conference on Computers, Freedom & Privacy (1991) sponsored by a dozen non-profit civic, professional, and industry organizations and received one of the first Electronic Frontier Foundation Pioneer Awards (1992). He is a member of the board of directors of Autodesk, Inc.

There is ample data *officially* available on which voters can base informed action. But it's *functionally* inaccessible:

INCUMBENTS' RECORDS: HOLDING THEM ACCOUNTABLE

Federal and state legislatures have computerized legislation, statutes, and codes. This digital information details representatives' votes on bills—and also lists each bill's sponsors, supporters and opponents, amendments and their sponsors, full text, summary descriptions, administration veto statements, etc. Usually, this data is in systems networked throughout each legislature.

Privileged staff, bureaucrats, secretaries—and usually incumbents' key campaign aides—have online access to these public records.

WE, THE PEOPLE: THE OUTSIDERS

Mere citizens, however, are generally prohibited from *timely* or *economical* access to these public records in their most useful (computerized) form—even though millions access comparably complex information via often-free BBSes or using the one to two million computers networked in the global Internet. Computerized government records are too often a high-profit item, monopolized by agencies or their "clients"—big-bucks information services. For example, California's state codes are available in machine-readable form—but reportedly cost $200,000 per copy, with access limited to the lawbook publisher's monopoly, some of whom simply reproduce them on high-priced CD-ROMs.

Taxpayers paid for creating and networking these public records, but they must pay lots more to access them from LegiTech, StateNet, WestLaw, Mead Data Central, etc. Public information, crucial for informed decision-making is available online—but not at prices appropriate for voters.

Solution: (Send to current and hopeful representatives. Request prompt response.) Ask that all public records available online to their staff be downloaded nightly onto a micro for public, read-only, dial-up file downloading (cheap, fast). Then libraries, institutions, non-profit orgs—and present profiteers—can have equal access to the public's records, at far lower per-copy cost than that of printing a single copy.

If they can't afford the $5K-or-so for hardware, tell 'em we'll find donors. If their computer staff doesn't have the time or talent to do it, tell 'em we'll find spare-time volunteers who'll do the job in a week or two.

If they still refuse, let's elect replacements who *will* support economical and timely public access to public records in useful form—essential for honorable representative government. This doesn't exclude other, government-provided online public access; it merely breaks public-records monopolies.

POLITICIANS' REAL CONSTITUENTS: IDENTIFYING CAMPAIGN CONTRIBUTORS

Every viable candidate and campaign organization must timely report dollar values and donors' names, addresses, and affiliations for all "significant" contributions and loans—funds, facilities, services, or guarantees. These reports—to a local County Clerk, state Fair Political Practices Commission (FPPC), or Federal Election Commission (FEC)—are public records. To find out what interests a candidate or initiative will *really* serve, review their largest donors. Accessing and analyzing campaign reports, however, is a real hassle.

Solution: Most significant campaign operations maintain the required information and print the required reports, using micros. So (1) require that organizations exceeding appropriate donation levels submit required data in machine-readable form, as tab-delimited ASCII files, as well as in paper form; (2) grant the public full right-of-copy; and (3) make the machine-readable data available for only the incremental duplication costs or by dial-up access, as above.

Computerized government records are too often a high-profit item, monopolized by agencies or their "clients" —big-bucks information services.

Then we voters can act as *informed* decision-makers.

RESURRECTING DEMOCRACY: LIMIT LOOT'S SOURCES & SINKS

Using terms already tested by the FPPC and FEC, we voters can retake political power from cash-flashing special interests, with a ballot initiative like this:

1. Campaign organizations shall be made only by individuals who are qualified to vote in the associated election (i.e., no PACs, no special interest groups, no foreign donors, no maximum donations by each of a family's numerous minor children, etc.).

2. Campaign organizations shall devote 20% of each printed or broadcast advertisement to listing the amount, name, city of legal residence, and employer/profession of contributors, rank-ordered by dollar amount, largest donor first. Listings in print ads and literature shall be at least 8 points in size (newspapers should love it!). Listings in radio ads shall have words/minute within 10% of the rest of the ad's verbiage. Listings in television ads shall be black letters on white blockouts, at least twenty-four raster-lines

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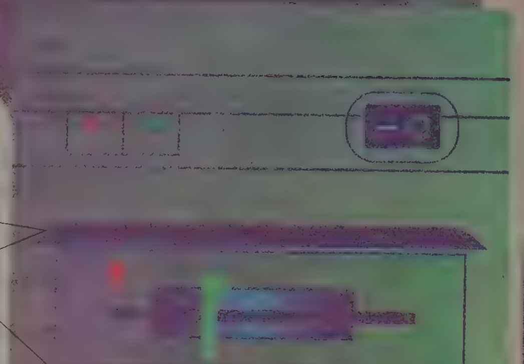

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THE ELECTORATE AS COMMUNITY: CONTACTING VOTERS

Reflecting the public nature of participating in crucial community decisions, voter registration records are public (with few exceptions). They are almost always available in machine-readable form. County-wide reg records can easily be stuffed into a $1500 disk. Silicon Valley's Santa Clara County has about 760,000 voters; San Mateo County, about 325,000. Any robust database software can process 'em—Acius's 4th Dimension (Mac), Borland's Paradox (PCs), Fox's cross-platform dBASE-like systems, etc.

Computer-assisted community groups can then help election-day transportation, assist absentee voting, create walking-order precinct lists, target mailings when using limited funds, etc.

PUBLIC RECORDS' "COPYING COSTS"

The California Public Records Act explicitly includes computerized records and mandates that copies be provided for a fee that "shall not exceed the actual cost of providing the copy."

Hidden under Sacramento's summer budget posturing, AB2543, by Assemblyman Ross Johnson (R), snuck through the Assembly and Senate and was sent for the Governor's signature with no listed opposition.

Some officials, such as San Mateo's service-oriented County Clerk, Warren Slocum, keep fees minimal—$150, you furnish the tape—for about 325,000 voters.

Others, such as Santa Clara's County Registrar, George Mann, charge over $800 for slightly more than double the number of records, and an underling said they hoped to quadruple the fee as soon as elections are over. Rationale: Prorate every possible expense into the "copying" fee—building depreciation, electric bill, computer system, staff retirement benefits, and probably the kitchen sink. So much for the legislature's obvious intent that fees cover only incremental copying costs.

Surprise! There's apparently an exemption for authorized political parties.

PRIVACY? WHAT PRIVACY?

Use of voter records is limited to election-related activity. Not so for your DMV records:

Hidden under Sacramento's summer budget posturing, AB2543, by Assemblyman Ross Johnson (R), snuck through the Democrat-controlled Assembly and Senate and was sent for the Republican Governor's signature August 17th, with no listed opposition. It authorizes sale of "information relating to" our driver's license and vehicle registration—including name, mailing and residence address—"for commercial use," including, but not limited to, direct mail advertising. Of course, our personal data must be "maintained confidential" by those direct marketers. At press deadline, it was awaiting the Gov's sig. (Spotted by Greg McVicar and Gabriela Castelan of Pacific Multimedia and PressOne in Walnut Creek.)

NEW MNEMONIC: DRIP

Abbreviation for a powerful instruction, built-in to the nation's largest self-modifying computer, the electorate: "DRIP" stands for "Don't Reelect Incumbent Politicians."

And, beginning next month—a return (politicians permitting) to fantasies of unrealized techno-toys.■

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Newton News

Apple Envisions Broad Range Of Applications

BY MITSU HADEISHI

Apple currently says it will be shipping the first Newton devices sometime in the first quarter of 1993, at a price "well under $1000" (according to Apple, not just meeting the $1000 target, but significantly breaking that barrier as well). As I mentioned in last month's column, even at $1000 a Newton would be considerably cheaper than any currently shipping pen-based unit. However, if they really make the "well under" $1000 target price, that means a potential revolution in the palmtop computing industry.

NOT JUST A DEVICE

I was able to speak with Michael Tchao, an engineer working on the Newton team, and learned a number of interesting facts about the technology.

The Apple Newton is really not just a single device, but rather an entire technology for pen-based computing, intended to cover a wide range of potential products. The notetaker product, a handheld Newton-based machine, is merely one of many possible products based on the Newton technology, namely the ARM 610 RISC processor and the Newton operating system and support software. Other product concepts Apple has proposed (these are merely product concepts, not necessarily actual products) include a "draw and spell" device to help teach children how to write, an integrated Newton fax/phone, a Newton portable map, a Newton-based architect's sketchpad or drafting table, a large-scale Newton whiteboard, and others.

Some of these ideas are quite workable in the near term (the fax/phone and map), others will require further reductions in price of various hardware components before they're likely to be marketable (since it is a children's device, the draw and spell product would have to be inexpensive, and the electronic whiteboard would require a very large display). Thus Apple is indicating that its plans for the Newton technology involve applications that stretch many years into the future. In addition, as I mentioned in a previous column, Apple has licensed the Newton technology to Sharp Corporation.

The Newton will also be very customizable; users will be able to do everything from design their own forms to writing their own applications for the Newton using its built-in system language. All of its information is stored in a powerful object-oriented database, with complex dynamic links between different kinds of data throughout the system. This means the Newton is not only a sophisticated palmtop organizer but also a powerful database engine. It can be used as a front end for access to large databases of information, which can be viewed in a variety of different, user-definable ways; in addition, when the device is connected to large databases via plug-in cards or a remote network, there is built-in support for retrieving the information and relating it quickly to other information in your Newton. This goes a step beyond multitasking by integrating all of the information in the unit in a single large-scale, unified database. Because the object-oriented database technology is built into the unit, it will be available to all applications transparently. This gives the Newton environment a seamlessness that would be the envy of many a desktop operating environment!

One of the advantages of the Newton design team is that they have hardware and software people working closely together; the lead hardware engineer is also a software hacker, and the lead software engineer loves hardware. Thus the hardware design people can help the software people if they need some help to implement a particular feature. This team approach to product design is quite refreshing, and could contribute to a more cohesive product for the end user. Many of the current palmtop computers are DOS-based and tend to be designed to run off-the-shelf software as much as possible; this may not really be all that optimal for a handheld unit. The Newton, designed specifically for the handheld and pen-based markets, changes these assumptions.

NEWTON CONNECTIVITY

Connectivity with PCs and Macintoshes is a central aspect of the Newton design. There will be a number of different ways to transport information from the unit to and from PCs.

Support for transferring the information to and from PC-based personal information managers (PIMs) will of course be a priority. However, because the Newton stores information in an object-oriented database with links, if the information is exported to a PC- or Mac-based PIM, the links will be broken. Because of this, Apple is also planning on releasing a subset of the Newton's Intelligent Assistant environment that will run on the PC and the Mac, so the full object-oriented database can be exported, links and all, and accessed and modified on a PC.

Note that this does not mean the entire Newton operating system will be running on the PC or the Mac; just a subset of the Newton functionality to allow the object-oriented database to be transferred.

In addition, Apple has signed various agreements with Motorola and other companies to research and develop mobile information broadcasting systems that would allow access to various databases, even remotely. For example, a Newton unit equipped with a cellular modem could access remote databases via the cellular network; one equipped with a paging network common carrier receiver could receive information updates such as changes in schedule, brief messages, and so forth via the paging network.

The Newton will be aided significantly by a software architecture called Intelligent Assistant. For example, if your unit was equipped with a fax modem and you wanted to fax a document to someone you know named Frank, you would simply write "fax Frank." Your Newton would look up Frank in the address book, then format and prepare the current document to be sent to Frank the next time the unit is connected to a phone line. Connecting to other Newtons, transferring information back and forth, and connecting to remote email

Continued on page 244

RESOURCES

Apple Newton
Apple Computer, Inc.
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Momenta Corporation
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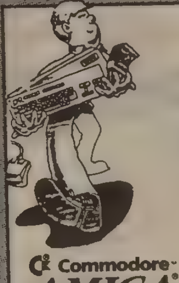

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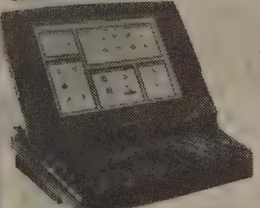

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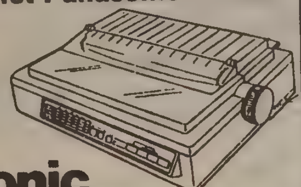

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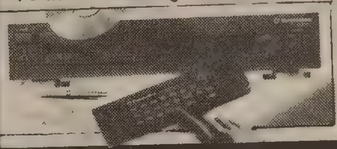

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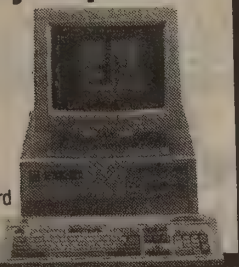

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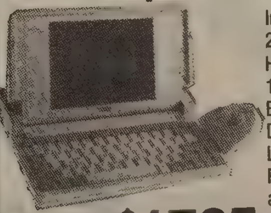

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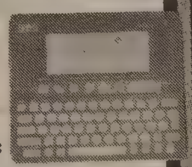

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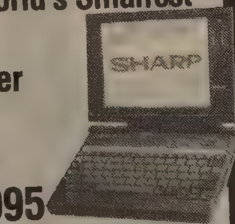

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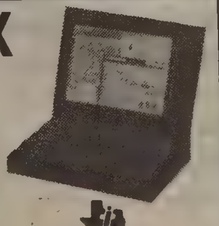

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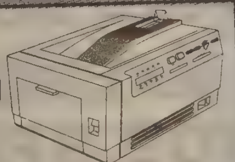

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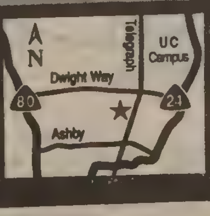

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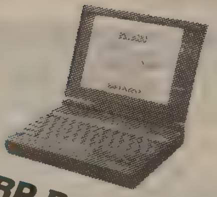

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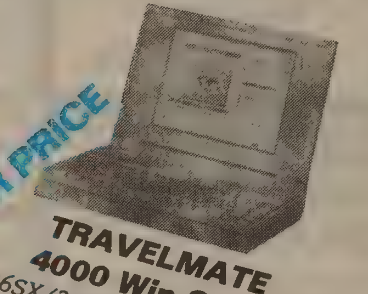

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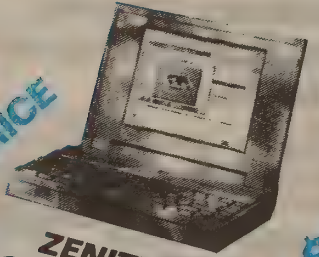

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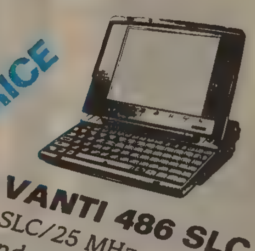

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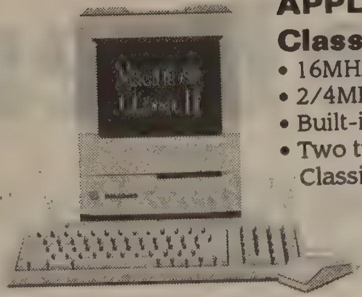

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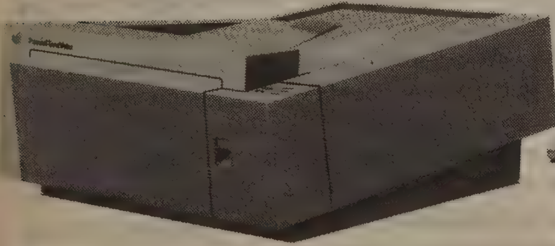

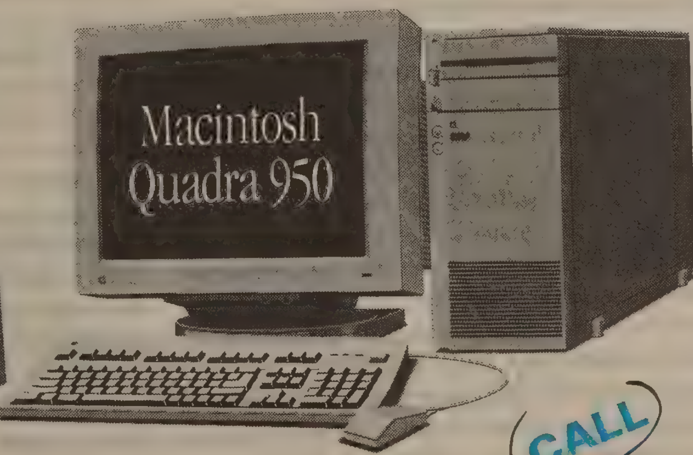

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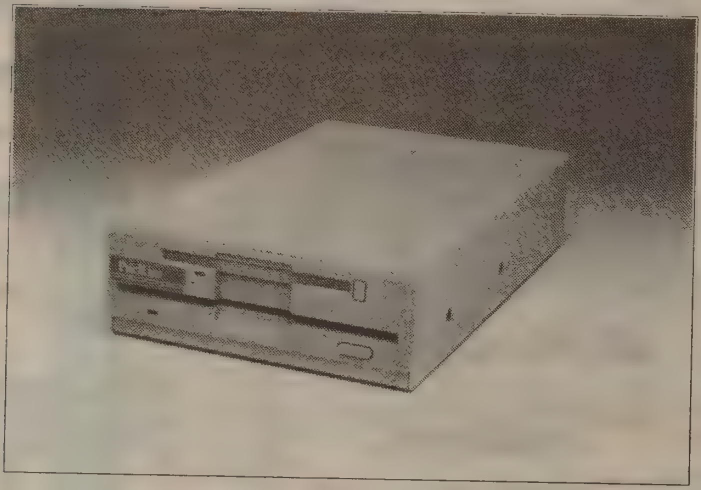
The Dream Drive

No Matter Where You Are Or How Old Your Hardware Is DoubleDisk Lets You Use The Latest Disk Technologies

BY ED KAHN

Portables are great, but they cannot always take the place of desktop machines. One of the main deficiencies of portable computers is the limitation in floppy disk drives. A good desktop computer lets you work with both 3.5" and 5.25" disks. But portables generally have only a single 3.5" drive. While this is adequate for most jobs, there are many times when I need to use a 5.25" disk. In the past, I have used a dedicated 5.25" external drive, but somehow this seemed both too expensive and too much trouble for the benefits it provided. To avoid using an external drive I simply make sure that all the disks that I need for my portable come on or are copied onto the smaller size disks.



The need to make sure everything is on a 1.4MB 3.5" disk recently changed. There is a new product on the market that makes having an external drive for portables worthwhile—the PacRim DoubleDrive. This is quite a drive! It is the size of a half-height drive, but has both a 3.5" and a 5.25" drive. It attaches to any IBM compatible through the parallel port. Your printer can be attached through the port on the back of the DoubleDrive. After installation, via the included software, your computer will recognize two additional drives.

The DoubleDrive has its own power supply, which means that it is not ideally designed for "on the road" applications. But the potential usefulness of this drive extends beyond the laptop and portable market. Older computers, for instance, that do not have the capability of recognizing newer drives will now work perfectly with high-and double-density disks.

I recently worked with an older IBM XT machine that could only read 360K disks. Under normal circumstances, there is no way to get such a computer to recognize other disk formats. With the DoubleDrive attached, it could now read any disk I needed. This is quite a feat as the older BIOS found in these computers does not know about either 3.5" disks or high-density 1.2MB disks.

Although not yet widely used, many newer computers are able to use the new Extended Density 2.88MB 3.5" disks. This new format, on special ED disks, is also available with the DoubleDrive. And if you have an older portable or desktop that does not recognize this format, it will still work with the DoubleDrive. This product gives you the means to utilize the newest disk technologies regardless of the limitations of your existing hardware.

Installing the DoubleDrive is simple, although there are a few problems that I assume will be corrected in the software upgrades. After attaching the drive to the parallel port of the computer, simply insert the provided software into the A drive of your computer and type "install." Answer the questions that are presented and the program should install a new device statement into your CONFIG.SYS file and copy a file over to your root directory. This should be a simple procedure, but ended up taking me a good deal longer than I anticipated.

The potential usefulness of this drive extends beyond the laptop and portable market. Older computers, for instance, that do not have the capability of recognizing newer drives will now work perfectly with high-and double-density disks.

The install program asks you how you would like your first drive installed. I mistakenly answered that it should be a 3.5" ED drive. The correct answer was a 5.25" 1.2MB drive. Likewise, I answered that the second drive should be configured as the 5.25" drive rather than a 3.5" drive. Logic told me that I was right, but the instructions told me otherwise. In any case, the device line did not show up in my CONFIG.SYS file, and I had to figure out what it should have said and add it manually. When I finally had the software installed correctly, the device worked like a charm. I have installed the software on all of my computers so I can move the drive around from computer to computer as needed.

While I have resisted buying add-on drives for portables because of the expense and limited applicability, this drive makes sense because it can be used with a wide range of machines and disk formats. The only requirement is that the computer have DOS 3.1 or higher. If you need a second drive for a portable or have multiple computers that could utilize this unique drive, investigate the DoubleDrive. It has a list price of $449, but you get a lot for your money and it provides features not available elsewhere. ■

RESOURCES:

DoubleDrive, $449
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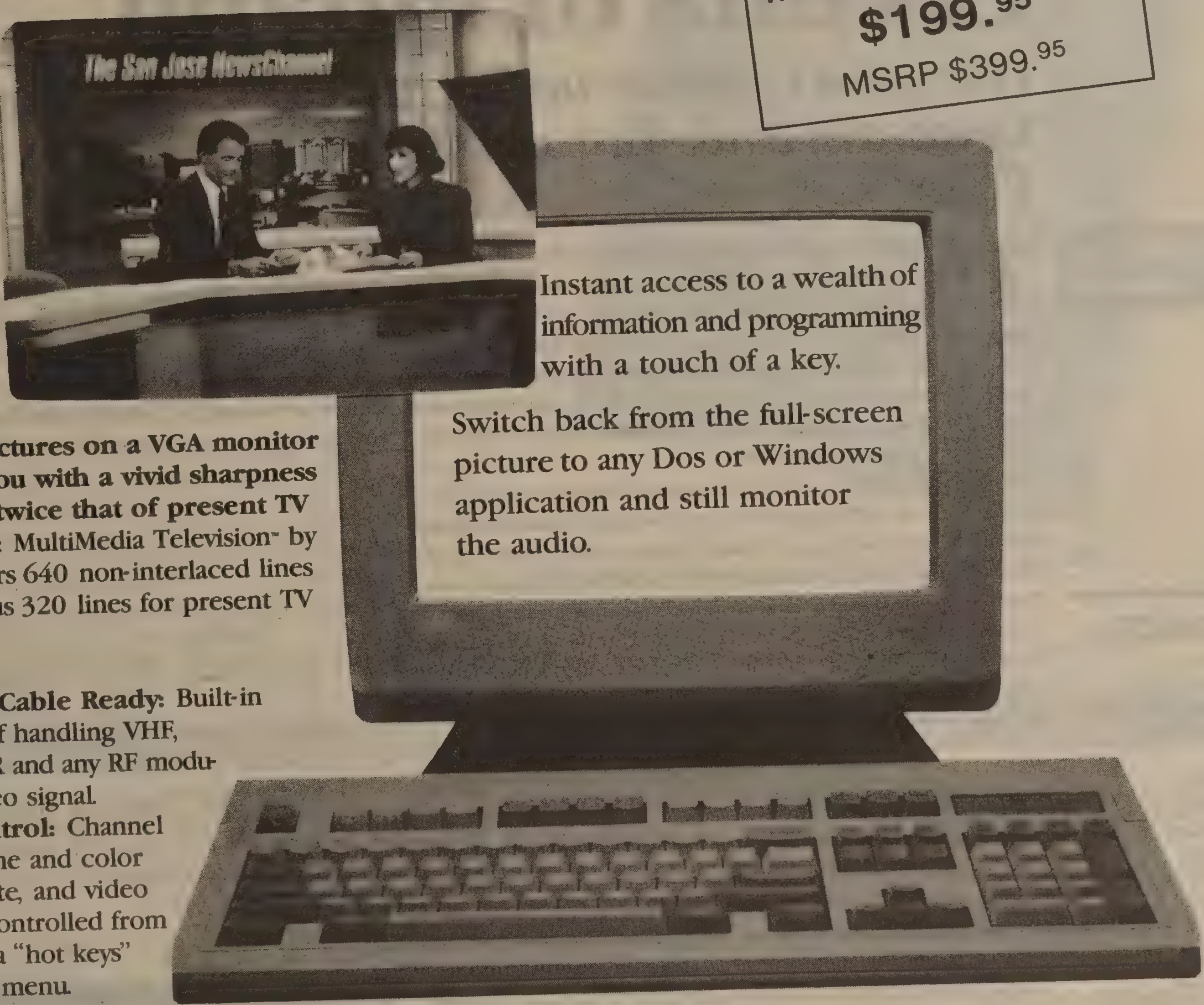

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Tracking Debits And Credits In Poland

Using SBT Financial Software For The Macintosh To Evaluate And Manage A Company In A Changing Economy

BY KIMBERLY GUZEMAN

The 1990 elections in Poland, its first free elections in decades, brought with it many far reaching changes. The change from a centrally planned economy to a market-driven system also created the need for new accounting systems and software. Polish companies are learning about profit and productivity as opposed to the previous system of meeting the quotas set by the government and not worrying about how the product was made or about accounts payable and accounts receivable.

With the change to a market economy, many companies also started looking for foreign investment partners. Przedsiebiorstwo Przemyslu Ziemniaczangeo, Poland's major cereal company, attracted a group of US investors and became know as Torun-Pacific. The new investors sent Emanuele Corso (cofounder of Tech 2020, a systems integration firm based in Poland and the US) to set up a new accounting system closer to Western standards to help Torun-Pacific better understand as well as evaluate and manage its position in a changed economy.

RESOURCES:

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Sausalito, CA 94965
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SELECTING A SYSTEM

Corso went to Poland with a single Macintosh SE/30, believing as the investors did, that the company was much smaller than it turned out to be. Learning that Torun-Pacific is Poland's largest cereal manufacturer, Corso knew he needed to change his original hardware and software recommendations. Corso had arrived in Poland with atOnce, a respected off-the-shelf accounting program he was familiar with. But atOnce was simply too limited for Torun-Pacific's needs. This was especially true once he realized that the transition to a new financial system was not complete; accounting departments seemed to be working with one foot in each system. He also foresaw the difficulties explaining the new accounting system to the company's accounting department.

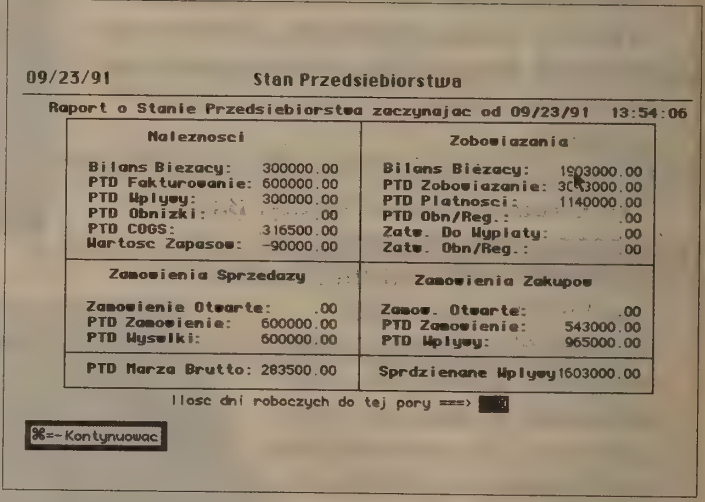
Corso decided his best option was to use software from Software Business Technology Corporation (SBT). He felt that the main reason for choosing SBT's software was the flexibility it offered by including its source code. The system Corso installed at Torun-Pacific consists of five Macintosh IIsi's and four SE/30's, using Farallon EtherNet for its local area network. He also customized SBT's Series Six Plus software.

BALANCING ACCOUNTS

Source code is what allows people to go into the software program itself and change it to fit their needs. Having the source code in effect allows the user to customize the software. Working with the source code, Corso changed the software to allow entries in Polish and easily handle their fairly unique accounting requirements.

When Corso went to Poland he had to study the changing system of accounting and the laws that went with them. Says Corso, "It was really difficult getting to understand the Polish legal system in regards to accounting." The West and Poland had two very different accounting systems until the changes were implemented in 1992.

Before the changes, to make a payment a company had to send a request to the bank to transfer money from their account into the account of the company to be paid. Only after the bank had verified that the company to be paid was allowed to accept money from the company paying them, would the money be transferred into their account. Corso had to find a way to train Torun-Pacific's employees to use a purchase order system. There was the added difficulty of the slowly changing economic system. There had to be a way to establish the new accounting system and teach people how it worked while still working with the old payment system.



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The Business Status Report gives Turon-Pacific immediate, real-time, and projected information about the status of its business in a changing Polish economy.

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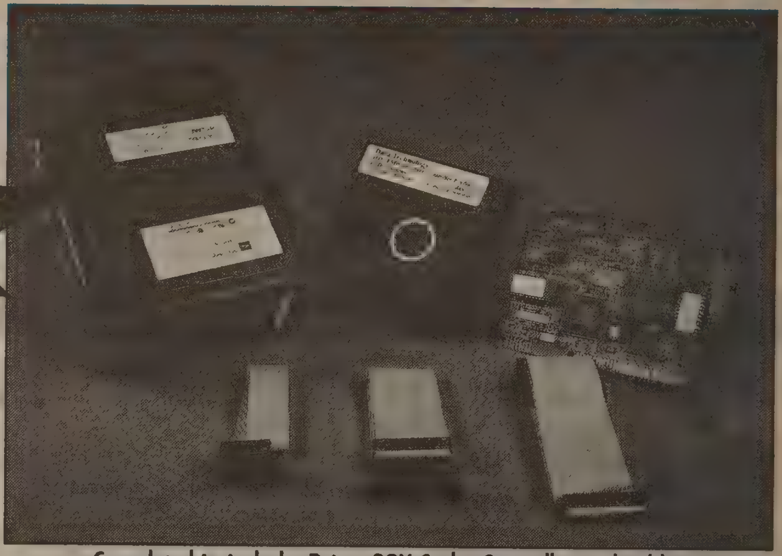

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> **The main reason for choosing SBT's software was the flexibility it offered by including its source code.**

Corso solved this problem by creating a document that would still work for requesting the money transfers and also teach the user about the accounts payable system they would be changing to. This involved using a document that looked like a bank check in a market economy, but still functioned as a transfer request. By using these "checks" that Corso had created they were able to post payments in the SBT software system as well. Because the "checks" were also being sent out, they did not have to make any additional changes to SBT's General Ledger. (SBT's Accounts Payable application does not post a payment in the general ledger until the check has been printed.) Thus, these "checks" were a good way for the company to get used to the new computer system as well as their new accounting system.

CHANGING FRONTIERS

Although limited, Poland does have some modern personal computer technology. For several years they have been able to purchase IBM PC clones from the Far East. On the other hand, Apple Macintosh computers were not available because of the US military's imposed restriction on the export of the Motorola's 68000 chip. It was not until restrictions were lifted several years ago that Macs were available in Poland.

To the best of Corso's knowledge, Poland has very little personal computing technology of their own. This lack of technology makes Poland a great market for Western companies. Says Corso of the Polish market, "It's large enough to warrant efforts at this time." Ted Tully, also of Tech 2020 agrees, saying that the market is "growing exponentially." ■

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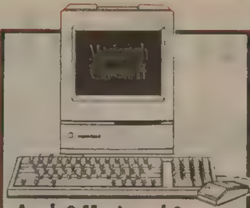
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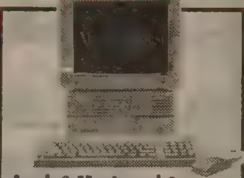
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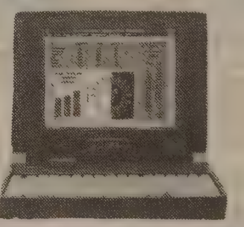

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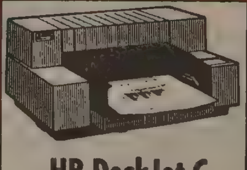
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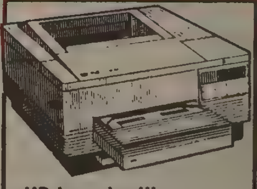
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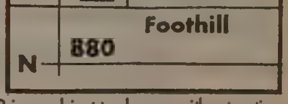

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Education Online

Online Education Programs Offer An Important Alternative To The Traditional University Classroom

The graduation ceremony gave students and instructors a chance to meet face-to-face after completing the University of Phoenix's Online education program

> "The instructors have a strong presence and they will pose questions online and then students will answer those questions and enter into discussions. It's much better than a correspondence course—in fact I even prefer it to attending a regular college or university."
> —Sharon Sutorka, management student

BY MARSHALL SMITH

On August 15, 1992, at 2 pm the Stanford Court Hotel in San Francisco witnessed an event that only a few years ago would have seemed impossible. Fifty graduating students of the University of Phoenix Online educational program gathered together to receive Bachelor and Master of Arts Degrees and discuss their two years of interacting, communicating, and sharing ideas. Many of them had never met face-to-face. Students received their diplomas, meeting their teachers at the end of the academic year, rather than at the beginning. If this is beginning to sound to you a little bit like something out of Alice in Wonderland, don't worry—in a few years such electronic schooling will be so prevalent that the quirks of receiving an online education will seem completely normal.

"There are a few things you have to get used to in taking an online course like this," says Sharon Sutorka, a management student who works for Intel in Sacramento. "You don't have face-to-face contact with your teachers. I had to work around that, but I find that it's not really necessary and now I'm used to dealing with online teachers. Plus I really like not having to be at any particular place at a fixed time. I travel a lot and take my laptop with me and log in from hotel rooms and do my course work from there. With this program you're expected to visit your online classroom on a regular basis. The instructors have a strong presence and they will pose questions online and then students will answer those questions and enter into discussions. It's much better than a correspondence course—in fact I even prefer it to attending a regular college or university."

Although many of the professionals who attend the online program are already computer literate and experienced with the online world of communication, the University tries to keep its online program as simple as possible. Sharon Sutorka explains, "In my work for Intel I'm in support of many sites throughout the country. I'm familiar and comfortable with telecommunications and networking. Learning to take classes this way was not difficult. They have a straightforward and simple menu-driven program. The information is available on a twenty-four-hour basis, I can log on to my courses early in the morning or midnight, whenever it's convenient. That kind of flexibility definitely helps when you're balancing course work and a hectic work schedule."

The University of Phoenix is one of the largest private business schools in the country, with more than fourteen thousand students in twenty-two campuses and learning centers located in Arizona, California, New Mexico, Colorado, and Utah. University of Phoenix Online courses were launched in August 1989 after founder John Sperling participated in an online program and decided that online classes could furnish working adults a great opportunity to continue their education.

Currently five hundred students are utilizing the online service to further their education. The student population is evenly divided between graduate and undergraduate students. In the beginning the student body was 90% male. The most recent survey of students showed that 27% were women.

People can call University of Phoenix Online for information on how they can use their modems and communications software to demo the system and experience the pro-

Copyright © 1992 by Marshall Smith. All rights reserved. Marshall Smith is a San Francisco-based writer whose work has appeared in Bay Area publications including the San Francisco Chronicle *and the* Whole Earth Review.

gram firsthand. The courses are taught from a simple menu-driven interactive system that is familiar to anyone who has ever accessed an online BBS. The unique forum of the electronic classroom allows students to participate in discussions and compose their answers before committing them to the computer screen. Melanie Baker, Marketing Coordinator for Dames & Moore in Denver, put it this way: "Think how nice it would be if you were in school and the instructor asked you a question and you could make time stand still while you gather your thoughts and compose your answer. Well, that's exactly what you get to do with University of Phoenix Online."

This interactive online classroom is made possible by the University of Phoenix customized online computer conferencing system ALEX (Apollo Learning Exchange). Based in San Francisco, the University of Phoenix Online program currently consists of two 386-based file servers with mirrored 300MB hard drives and twenty modem lines capable of 1200 to 9600 baud. "We're in the process of converting to a UNIX-based redundant system on two 486 machines." says Kelly Krueger, MIS manager. "We can be accessed by any computer that has a modem and communications software, as well as a word processing program that can deal with ASCII text. We also use the Lotus 2.0 standard for spreadsheets."

Kelly Krueger went on to describe some of the upgraded features of the new software which is due to be installed in the fall of 1992. "The new system will have a number of features to make it even more user-friendly for students. Split-screen displays, automatic log-on, and an advanced off-line mail reader will all make it easier for our students to use ALEX."

Students at University of Phoenix Online log-on to the system an average of five days out of the week. Students do the bulk of their assignments and reading while off-line and connect to the system in order to retrieve new discussion material submitted by their classmates and instructors as well as send in their contributions, assignments, and papers. Most use software communication programs on their own PCs to download course material to read and work on, so the average connect time is only one hour a week. Since the University of Phoenix Online is open twenty-four-hours a day, most students use cheaper nighttime telephone rates to download their course material and keep their average long-distance phone charges to around $35 per course. The structure of the course is such that a good deal of student and faculty interaction is required. "To be a successful online student you have to spend time working with the system. You have to participate," says Tom Bishop, "You've got to download necessary files and do your reading. There is a good deal of structure to this system. We divide the students into small classes of eight to fifteen to keep the classes manageable for both students and instructors. We've found that when the class size reaches eighteen much of the dialogue becomes counterproductive, and we divide it into smaller groups. All of our students are working adults, who are making sacrifices in their busy schedules to attend the online program. They tend to be highly motivated and the class discussions are quite lively and relevant."

"We listen to our students closely," continues Bishop, "we ask them what it is that they want from us. After they've completed a class we ask them if they were satisfied and for their suggestions on improvements. This feedback has helped us structure the classes to achieve maximum results."

Bishop explained how all of the instructors working at University of Phoenix Online are professionals in the fields they are teaching. "It's a very real-world environment. You get a whole different perspective from University of Phoenix Online than you would from attending traditional university business school classes. You're dealing with people who are making their living in the field you're studying."

When asked about the future of telecommunications in higher education, Bishop was very enthusiastic. "This is definitely a segment of university studies that is expanding rapidly. Both Purdue University and the University of Pittsburgh have recently introduced online programs targeted to executives and CEOs. A lot of people are becoming interested in continuing their education while they practice their careers. Research has shown that the future of higher education is pointed more and more to the needs of mature adults. This is the age group of students that is expanding most rapidly, and the use of online educational systems is an excellent way to reach these people."

The students of University of Phoenix Online represent a number of diverse occupations and industries: 38% are middle managers, 44% are technical or licensed professionals, and 20% are executives and business owners. The average age is thirty-eight. Up to 75% of the students receive some degree of reimbursement from their employer for the cost of the program. Out of the total of five hundred students, 180 are taking the forty-credit, two-year MBA program which includes the complete spectrum of management science. Degree programs currently include: Master of Business Administration (MBA), Master of Arts in Organizational Management, Bachelor of Science in Business Administration, and Bachelor of Arts in Management.

"Think how nice it would be if you were in school and the instructor asked you a question and you could make time stand still while you gather your thoughts and compose your answer. Well, that's exactly what you get to do with University of Phoenix Online."

—Melanie Baker, Marketing Coordinator for Dames & Moore in Denver

The University of Phoenix is accredited by the Commission on Institutions of Higher Education of the North Central Association of Colleges and Schools, one of the two oldest and the largest of the regional accrediting bodies recognized by COPA (Council on Post-secondary Accreditation) and the US Department of Education.

When asked about the process of interacting with other online students, University of Phoenix student Gary Wilmott says that in the online community he has yet to find any "cliques," which are so prevalent in many computer networks and bulletin boards. "Usually the situation I find is that no one knows you, hears you, or sees you. You're judged by your knowledge and your online responses. In a traditional college classroom you get a feel for what the instructor is going to ask just by face-to-face interaction. By listening to him every day you can pick up on what he's interested in. In the online classroom environment the one way to make sure you'll know what the answers to test questions, is by reading *all* of the course material. In a traditional classroom you tend to skim and browse the reading material and listen to the instructor. For University of Phoenix Online I find I read a greater percentage of the course material, so in that sense I learn more from the online class."

University of Phoenix Online is experiencing rapid growth as more and more working adults realize that they can advance their education while keeping their careers on track. The university receives over a thousand inquiries a month about its online educational services. University of Phoenix Online has positioned itself as a viable and, for many busy adults, a preferable, alternative to the traditional university classroom. ■

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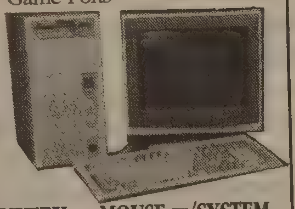

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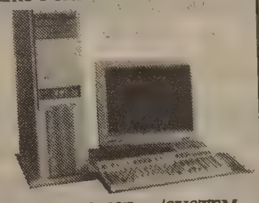

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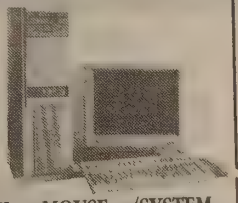

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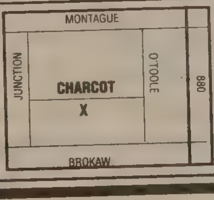

Working From Home

California Leads The Nation In Recognizing The Benefits Of Telecommuting

BY ROBERT MOSKOWITZ

If you recognize telecommuting as the wave of the future, then you'll be glad to know the US beach most likely to feel its impact first will be California. Already, the surf is a little stronger than usual.

California is well ahead of other states in recognizing the contribution of telecommuting to energy savings, pollution control, industrial competitiveness, and overall quality of life improvement for its citizens. In fact, California planned and implemented a telecommuting pilot project—and even completed it—before most other states were first awakening to the concept. Perhaps most important, California is one of the first states to place laws on its books that support telecommuting among private companies and that extend the scope of telecommuting projects among state, county, and city government agencies.

CALIFORNIA IS HABITUALLY ON THELEADING EDGE OF TRENDS—BOTH MAJOR AND MINOR. AND TELECOMMUTING IS THOUGHT BY MANY TO BE ONE OF THE MOST SIGNIFICANT TRENDS FOR THE TWENTY-FIRST CENTURY.

For example, California has authorized partial funding for three "telecenters" in Ontario, Apple Valley, and Riverside. The telecenters—appropriately equipped public offices and conference rooms that can be booked for use by the day or week—are meant to be used by employees of any qualifying company, much like a telephone booth or a hotel meeting room. Although the charges an individual user pays for time spent working in such a center are presently subsidized by the state, the plan calls for people and their employers ultimately to pay their own way.

In addition to funding telecenters, the state has set up an innovative "space exchange" program in Southern California. This allows participating city, county, and state employees to work some of the time at any available government office, rather than their assigned work location. This allows these employees to cut down on commuting time and distance by finding an alternative work location closer to home.

CALIFORNIA: THE PERFECT PLACE FOR TELECOMMUTING

All this should not be surprising because, thanks to at least three important factors, California is the perfect place in America for telecommuting to catch on. One factor, of course, is that California is habitually on the leading edge of trends—both major and minor. And telecommuting is thought by many to be one of the most significant trends now in sight for the twenty-first century.

A second factor is that telecommuting brings a direct and immediate improvement to the quality of life, something most Californians have long held close to their hearts and minds. Telecommuting not only helps save the environment, it can save a telecommuter's very life by reducing stress, providing more time during the week for family and personal activities, and generally preventing the "death by overwork" syndrome often noticed in Japan and other industrialized countries.

A third factor that makes California a perfect setting for telecommuting is the modern communications technology often involved. According to J. Ron Cross, director of regulatory policy analysis for Northern Telecom, in Nashville, TN, "telecommuting is essentially the art of substituting communications technologies for travel." And where but California are we likely to find so many people at home with so much advanced technology?

TELECOMMUTING PROJECTS

But while talk of the future is mere speculation and conjecture, it's a plain and simple fact that California has already enacted legislation that favors and supports the increased use of telecommuting in California. According to David K. Fleming, director of the state's Telecommuting Project, a recently passed law authorizes (and as a practical matter, encourages) state agencies to use telecommuting as a work option for their employees. He also points to the telecenter funding, the space exchange program, and other planned initiatives on behalf of telecommuting.

Fleming is the mastermind of California's Telecommuting Project, which allows state employees who volunteer for the program to be paid while working from home offices or telecenters. The idea was conceived back in 1983 as a way to help manage and reduce the state government's growing appetite for office space. Legendary telecommuting consultant Jack Nilles was brought in to help plan the pilot program, which was funded in 1987 and completed in December 1990.

According to all accounts, California's pilot telecommuting program yielded extremely successful results. More than two hundred state employees from two dozen state agencies took part, and the report—widely disseminated nationally to those interested in promoting telecommuting—led other states to dispense with pilot programs and go right to implementation. In California, a Telecommuting Unit was created in the Department of General Services to administer telecommuting for other state agencies. There are now well over one

Continued on page 250

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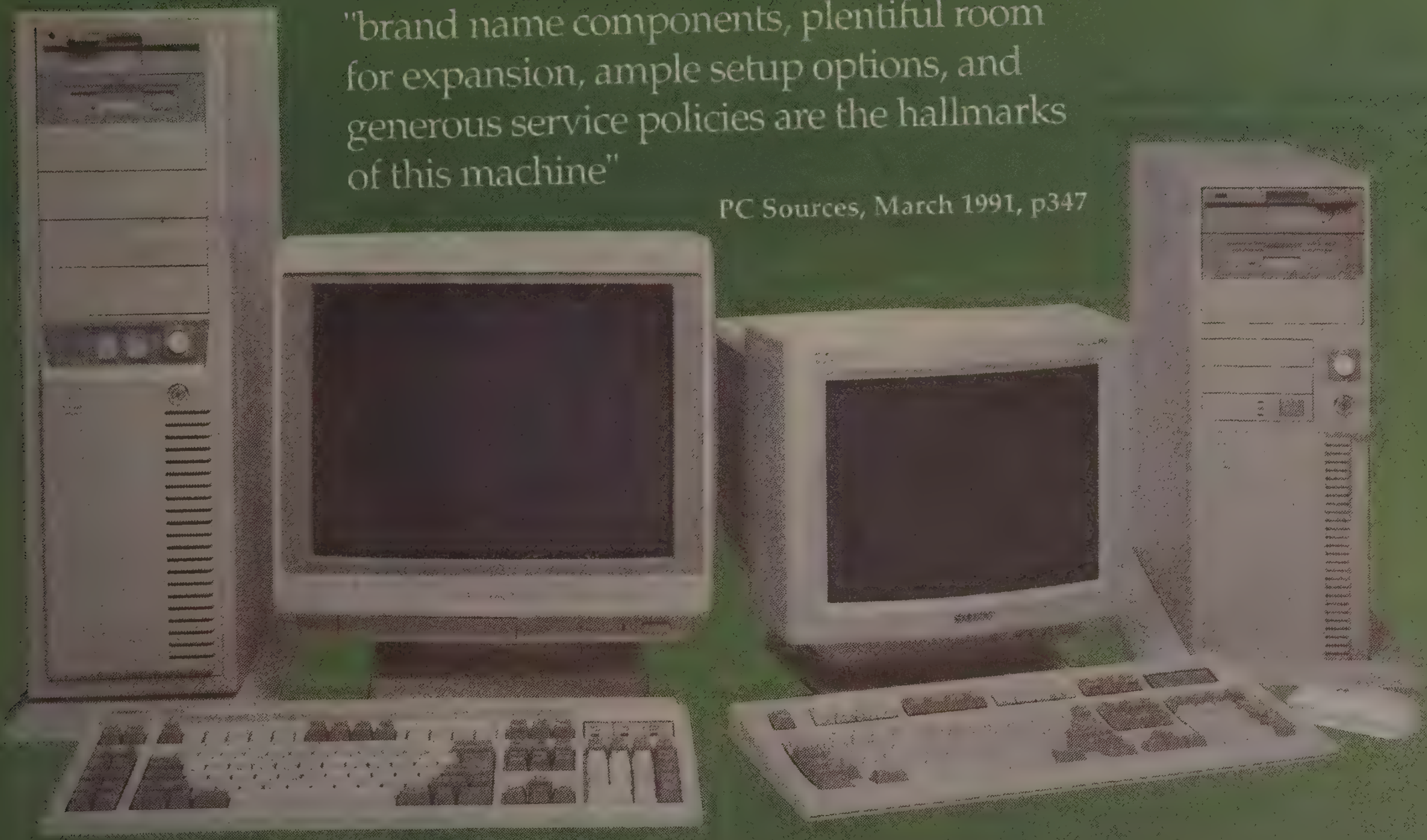

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PC Sources, March 1991, p347

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Computer Shopper Magazine June 1991, p246

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Computer Shopper Magazine
June 1991, p246

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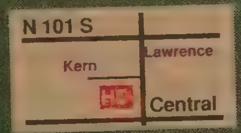

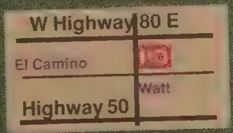

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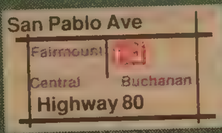

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Accounting Software For Law Firms

Computerized Accounting, Practice Management, And Litigation Support

BY DAVID SIMON, CPA AND JENNIFER ROBIN CHERNISS

Law firms and other providers of professional services are faced with specific operational issues effecting their selection of computerized systems for accounting and other administrative functions. Legal practice-oriented software and other tools are available to track day-to-day transactions, time, and expenses; to record and process information for client billing and trust funds; to schedule and budget projects; and to evaluate staff performance. Programs also exist to aid in the calculation and presentation of settlements. The role of all of these is to keep track of a firm's books, operations, and number crunching, so that the staff can concentrate the majority of their efforts on the real business at hand; namely, the practice of law.

This article surveys some of the needs and opportunities for a computerized, small- to medium-sized law office. A brief discussion of general and specialized accounting software is presented below, followed by suggestions for practice management and litigation support packages.

GENERAL ACCOUNTING REQUIREMENTS

Basic accounting requirements consist of general ledger, accounts payable, and accounts receivable. General ledger includes a chart of accounts and the ability to process and produce financial reports such as income statements and balance sheets. Professional firms often employ time and billing software, a specialized form of accounts receivable which tracks time and expenses and generates invoices for services rendered. Accounts payable manages payments to vendors; in smaller firms, this function may sometimes be omitted from the computerized accounting system.

With the array of general accounting software available, there is a tendency for some attorneys to select a more complex system than is really needed, perhaps with the expectation that they will "grow into it" as their caseload and staff increase.

Actually, smaller law offices have about the simplest general accounting needs of anyone—cash basis, no inventory, no project costs to capitalize; no-fuss accounting.

A straightforward approach was taken by Marilyn, who formerly worked for the District Attorney and now defends white-collar criminals. Her staff consists of a legal secretary plus part-time administrative help and research consultants. Last year she took in well over $300,000. Reluctant to believe me at first, she is now happily using a $49.95 "personal" accounting package for the general ledger and accounts payable. It runs on a desktop PC. She uses a separate package altogether for client billing and an affordable payroll service relieves her staff of those hassles.

"Why waste money for software we can't understand?" she now says, "I use the laser printer for most of my checks, so it all goes through the system. When it's time for year-end tax planning, I just click here and print the reports." As her CPA, I look forward to receiving her well-organized records at tax time.

LOW-END AND SUPER-ECONOMY ACCOUNTING PACKAGES

With the exception of firms that need complex project cost tracking capabilities, small law offices should forgo the high-end packages and stick with simpler products designed for personal or "mom and pop" use. Several such programs are available for DOS, Windows, or Macintosh.

The Windows accounting products on the market thus far are mostly low-end. Nevertheless, I personally find them superior to comparably priced DOS packages, both in features and ease of use.

MYOB, by Teleware, especially emphasizes ease of use. Although the reports are rather basic, they are adequate for the needs of most small professional offices.

Computer Associates' Simply Accounting is well designed and also easy to use, although it includes inventory and job costing functions which few law offices need.

Intuit is the producer of Quicken, a personal finance package which provides only the basics, but does so elegantly. But be forewarned that this package leaves no audit trail; i.e., no clear record of who entered or modified transactions and when. If you need to track payables, consider Intuit's QuickBooks, instead.

The new Peachtree Windows accounting product, Crystal, has impressive report writing capabilities. The setup takes full advantage of its graphical user interface, to the benefit of us mouseophiles.

Among many appropriate DOS packages, one sophisticated product that deserves mention is Professional Accounting Kit, just released by Great Plains Software. It is high-end in terms of complexity, but because it is limited to a single-user version, it costs only $400. Professional Accounting Kit includes all the necessary service-oriented modules as well as cash management and checkbook reconciliation.

PAYROLL CHOICES

There has recently been a flurry of new payroll software releases, including low-end payroll products costing under $150 which are intuitive and easy to use.

Nevertheless, a small law practice may not be the best place to employ even these. Payroll is a tedious clerical task. In a law office, everyone is usually running around with seemingly more pressing things to do on payday than drive a check to the bank. Outside payroll services simply don't cost that much, making it hard to justify the inconvenience.

For payroll, a missed deadline or even a small mistake can result in substantial additions to tax, not to mention the enormous inconvenience of additional paperwork. The IRS computer, once it identifies a discrepancy or an incorrect payment, is like a baby on an airplane—it's easy to make it cry and hard to get it to stop.

ACCOUNTS RECEIVABLE

In any accounting system, the general ledger can be thought of as the trunk of a tree. Accounts receivable and accounts payable are two main branches. In law practices, the accounts receivable branch is often of such great

RESOURCES:

MYOB, $249
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importance that, in terms of size, usage, and complexity, it outweighs the rest of the system.

Since legal fees are typically based upon time, the specialized accounts receivable modules are called time and billing software. More advanced packages, known as practice management software, not only accumulate time but track caseload and manage the firm's resources.

The examples described here start with relatively simple time and billing software, then briefly look at more powerful practice management packages.

TIME AND BILLING

Timeslips is perhaps the industry standard time and billing package among low-end users. It is memory resident, so that you can hit a hot key and start the meter when the phone rings or hit a hot key and record an out-of-pocket expense. Timeslips handles all the basics with finesse, and also provides some database capabilities with which to analyze billings. The user even has the option to activate a comprehensive list of legal billing abbreviations. Beyond that, Timeslips is designed for ease of use, not power or complexity. Its target market is the small firm.

A reflection of Timeslips' on-target design is that it has grabbed a large share of the market. It is, however, a DOS product. The market seems to be shifting toward Windows, and the hills are littered with successful software developers who failed to change with the market.

WInvoice, a Windows 3.1 time and billing package, is a close cousin to Timeslips in features, power, and price. As with Timeslips, billing options are flexible and you can assign client-specific fixed fees and rates.

Neither Timeslips or WInvoice is forgiving once a bill is finalized; these programs assume that a finalized bill is a mailed bill. WInvoice requires you to click a Finalize button on the invoice, after which, if you change your mind, you'd have to issue a debit or credit memo. Moreover, both programs have little ability to archive (i.e., store or retain old bills), so once you finalize a bill, it can't be reprinted.

PRACTICE MANAGEMENT SOFTWARE

Practice management software carries out time and billing functions and also provides information about how the firm utilizes its resources. There are numerous aspects of servicing clients. Primarily, of course, is the time spent on the client and the billing rate of the person whose time is spent. This much is handled even by the simpler time and billing software described above.

But practice management software also addresses budgets, scheduling, and performance. In other words, it has the ability to integrate information about time and use of resources, for purposes of management planning and evaluation.

In a law firm, practice management software specifically measures how effectively personnel are used. It also helps you determine whether the firm's resources are being spent wisely for a particular client or type of service. It provides this information in the form of management reports on such issues as productivity and billable vs. non-billable hours.

The powerful practice management programs will accomplish a wide range of tasks, including:

- Time and expense tracking by client and by project
- Project tracking and due date monitoring
- Scheduling of projects and staff time
- Various advanced processing functions

Every project has a budget, and within a project there may be various tasks, each of which is also assigned a budget. In addition to allocating dollar amounts, part of the budgeting process is employee scheduling to assure that the project is appropriately staffed and that each employee's time is being optimally utilized.

Time and Billing, from State of the Art Accounting Software, is a specialized accounts receivable module of M.A.S. 90 Evolution 2, a high-end integrated accounting system. A small- to medium-sized law firm may consider using this module as a standalone application, and opt to use a package on the low end for its other accounting needs.

As with typical high-end packages, this program also tracks several layers of budgets, including breakouts by client, engagement, work category, or work code. Other reports include billing analysis, employee productivity reports, and project scheduling.

For the firm able to justify a high-end integrated accounting system, the accounts payable module of Evolution 2 is fully integrated with Time and Billing. It allocates expense transactions to clients (through Time and Billing), and generates reports of cash requirements.

NexGen's Time, Billing, and Accounts Receivable (TBR) is a complete program for disbursement accounting and time management. It maintains and analyzes budgetary information at several levels, as well as billable and non-billable statistics. The program analyzes time utilization and a variety of other staff information. It also has a built-in custom report writer.

Unlike Timeslips, TBR retains a history of all time incurred, as well as copies of complete bills and other historical information.

FALLING THROUGH THE CRACKS

Most attorneys pass on to their clients such expenses as photocopying, faxing, and long distance phone charges. Keeping track of the nickels and dimes can cause a bookkeeping headache. There are hardware devices that can be attached to the copier, telephone, or fax machine for this purpose.

One such device is Copitrack, by Control Systems. It attaches to photocopy machines, and tracks the number of copies by client code.

Two devices which attach to the telephone are Callcost, by CMP Inc., and Scout, by Softcom, Inc. Callcost reports on each call immediately, and also produces periodic reports. Scout works from a dedicated computer attached to the telephone system. The files which it produces are transferred to the time and billing program periodically.

LITIGATION SUPPORT SOFTWARE

Software is available to assist the attorney with just about every aspect of litigation support. Whether negotiating a settlement in conference or in court, it is useful to be able to rapidly compute the economic consequences of multiple scenarios.

Programs are available which compute damages in personal injury and other tort cases, make actuarial projections of life expectancy and lost earnings, compute present values or annuitize settlements based on assigned interest rates, and evaluate the financial and tax implications of divorce.

Continued on page 254

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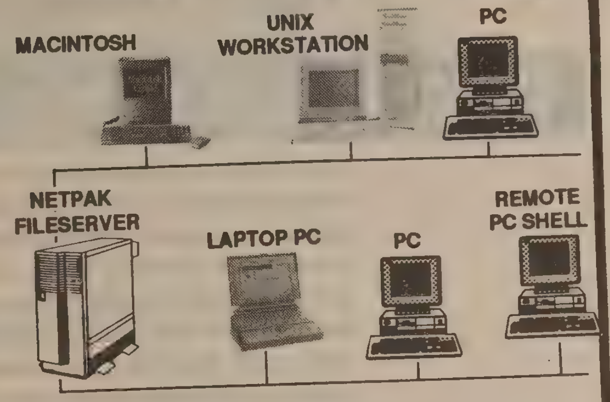

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Help Desks

Does Your Company Need One? Is The One You Have Doing The Job? How Will You Know?

BY MIKAEL BLAISDELL

In this current less-than-kinder, gentler economic climate, companies are especially interested in cutting costs. In every department, the budgetary battles are becoming even more fierce, and the knives are always being sharpened. But before you take that cost-cutter blade to your help desk, or to the proposal for starting a help desk, you first need to do some real cost-analysis. Help desks might look like a good cost-cutting target, but appearances are very deceiving—and the effects of a wrong choice are not trivial.

It's easy to think that you're saving money by cutting the help desk budget, or by not establishing one in the first place, but the easy look isn't accurate. Your company is already spending a serious amount of money for computer overhead that doesn't appear anywhere in the financial reports. Reducing the help desk budget will only increase that unseen overhead. The key is to clearly identify the unacknowledged amounts for that computer overhead that you're already spending, and then to use a portion of that money to reduce the rest.

REALITY 101

Regardless of the platform, operating system environment or application package, some level of training and expertise is always required in order to make use of computing resources. Despite the claims of the manufacturers, computers are not designed for businesspeople to just sit down and use them. No matter how well-written the manual and/or the context-sensitive help screens might be, users are going to get stuck at some point in their work. And when they get stuck, the cost meter should start ticking—for a staggering amount of money is being wasted every minute in the corporate world as users stare blankly at or angrily curse the uncaring machine.

All of us can easily recall times when the job came to a sudden halt because the computer went down, or because we had to stop to figure out how to make the software perform a needed function. Time spent waiting on-hold for the next available support representative, or lost in often-fruitless searches deep into the user or reference manuals, is literally uncounted dollars being thrown away in every company. Senior executives, administrative assistants, clerks, supervisors—personnel on every level and at every pay rate—are losing productive time to the struggle with the computer. Worse yet, such problems frequently are compounded when other personnel are pulled away from their own work to offer assistance and advice. Even a rough calculation of those losses will reveal a sobering figure, and yet that category and amount never seem to appear on the profit & loss charts.

THE NEW LINE ITEMS

Take a moment to analyze what your company is already spending for the following invisible or "buried" items—the ones that do not appear on the financial statements:

- •The time you lose while trying to figure out what went wrong with the system
- •The time you used to thumb through the manual, or to look up the procedure for a little-used function
- •The time spent using inefficient practices and procedures because "that's the only way I know how to do that operation"
- •The time you spent looking for the number to call, or even in deciding who to call about a problem or question
- •The time lost in waiting on-hold for the "Next available customer support representative"—while you listen to the On-Hold DJ play music for your enjoyment!
- •The time you spent in re-entering data or work to recover from an avoidable error, or because you didn't know how that lost data could be recaptured
- •The time that other people lost from their own work because they were helping you, or to train you

Now stop to consider that the above losses aren't happening just once—they are occurring over and over again, every day, throughout your company. The same lessons are being taught, the same errors are causing data to be lost and work to be re-done—the

> **Your company is already spending a serious amount of money for computer overhead that doesn't appear anywhere in the financial reports. Reducing the help-desk budget will only increase that unseen overhead.**

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Mikael Blaisdell is an Alameda, California-based customer support consultant. He may be reached at (510)865-4515, or E-mail: CIS 70365,1246; InterNet: tao@well.sf.ca.us

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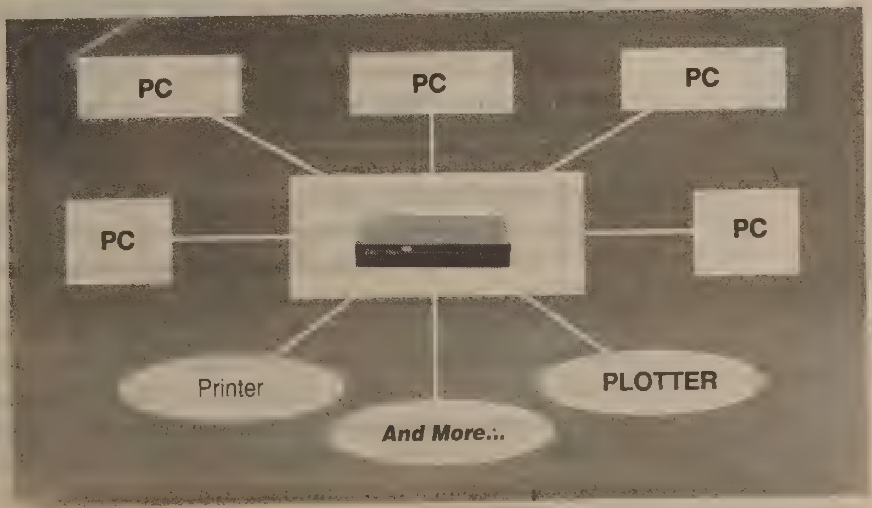

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very same wheels are being reinvented. You and your company are paying for those losses whether you know it or not, and the bill is steep. And the effects tend to multiply over time, and the hidden costs get even higher.

One of the factors that tends to send these hidden costs ever upward is that people will develop unofficial sources of help, regardless of the costs. Since the computers are a reality that must be dealt with if the job is to be done, one way or another, people will find solutions (given time) to their problems. However, keep in mind that when the boss is impatiently waiting for a report, the relative cost-effectiveness of the needed support or help is irrelevant to the harried worker.

A perfect example of hidden computing overhead costs and their associated effects that may be found in virtually ever company is the "power user." Helpful, knowledgeable, and readily accessible, it would seem that this type of user is valuable to the company. But the "value" can be questionable, and the cost for the service is likely to be upsetting.

UNAUTHORIZED SUPPORT REPS & UNOFFICIAL HELP DESKS

Found in virtually every organization, group, or department, the power user is often simply someone that learned how to do a particular function, or to use a software package, and then found themselves called upon to teach or assist other employees with similar needs from time to time. The cost of using that person as an unofficial support resource is another hidden expense, and is likely to be very high, especially if that "power-user" is a highly paid specialist. While their own work is delayed, the specialist spends expensive time helping others overcome problems. It's very costly, poor productivity for all concerned, and unfortunately a very commonplace occurrence.

Accountants refer to such expenses as "opportunity costs," and define them in relation to the benefits or opportunities that had to be foregone because the resource was being used elsewhere. In the case of unofficial support duties, there is an added factor in that the power user is probably not as good at teaching or supporting as a trained support representative would be, nor are they generally as knowledgeable. As a consequence, such support tasks will take longer and cost even more than it would if the help desk had been used.

Worse yet, power-users and their "fixes" are often the bane of the IS representative's life. The "solutions" that such power-users install are never documented, never consistent with corporate standards—and when an upgrade is installed that conflicts with the "solution," the power user is nowhere to be found. The end-result is that even more time is lost in trying to figure out what was done, where it went wrong, and how to fix it. All of which translates directly into even more hidden computing costs.

COUNTING THE BEANS

There have been various studies of the true costs of PC ownership and operation over the past few years. As the car ads used to say: "Your mileage may vary", but, depending upon purchase price, usage, etc., you can safely estimate that your original cost for the hardware and software of the system is only about 15-30% of what you're going to spend on that computing resource over its useful life. The remaining 70-85% will be spent on the often uncounted overhead of training, support, maintenance, and depreciation. A Banyan Systems report (done by the Business Research Group in Newton, MA) shows that the largest single cost factor over the life of the system is the ongoing personnel costs involved in operating, enhancing, and maintaining the system.

If you simply take the total your company has spent on all computer hardware and software purchases and then raise that figure by 70-85%, you'll end up with a ballpark idea for what your computer overhead is costing you. However, that figure, while grounds for serious thought, is only a starting place. Before you can take action to reduce it, you need to get clearer on where those dollars are going.

To be effective, cost analysis research needs to be done on an ongoing, consistent basis. The best source for data regarding your company's costs for computer overhead is the IS group, especially the help desk if you have one. While the accounting department should certainly be closely involved throughout the process (for more reliable and credible results), the leadership for the effort should come from the IS Group and Help Desk. Note that while you are tracking and analyzing the overall operational costs for your company's computer resources, you should also be carefully researching the costs of operating your help desk. Here, too, there are some hidden cost factors that are often overlooked.

If you've already got a help desk in operation, a lot of the data that you'll need should already be available from its records. If you haven't established a help desk, or the statistics have not been properly kept, there's no time like the present in which to start. The data developed by a good help desk operation can be immensely valuable to the company in a number of ways, especially in the evaluation of future software and hardware purchases. If a particular software package generates a high number of problems or calls per user, plus requires a lot of classroom training as well, the company should investigate alternative packages. Without accurate data, it is difficult to assess and consider such factors.

ADDITIONAL TRICKS & TECHNIQUES

If you haven't been keeping track of your computer overhead line items, or if you want to do some cross-referencing, there are some alternate methods to try. First, create a survey/questionnaire for all of the members of your company that asks them to estimate how much time they spend in the various categories. While you're at it, ask them to identify the specific software systems that they use and how much time they spend using these tools. Have the Accounting Group analyze the invoices for software purchases to identify all of the different packages in use.

From the list of packages in use, make another list of the "tech-support" phone numbers for these packages, then analyze your phone bill to see how many calls are going to these numbers. Also look at the length of the calls that you identify as "support" calls.

Get the IS group to calculate the total "down-time" for all systems over the past several months, and to analyze which departments were affected by the outages. The resulting figures may surprise you, and may also indicate where alternate backup systems should be made available.

The above research assignments may be done in-house, or by outside consultants. If you know somebody at your local college's School of Accounting, this might make an excellent internship assignment for a senior student or group of students under the supervision of a faculty advisor.

NEARING THE BOTTOM LINE

Once you have calculated the costs associated with the different categories of your computer overhead, and checked them with the Accounting Department, you are now ready to start looking at improving the bottom line. There are a variety of possible tactics; if you do have a help desk in operation, you are now in a much better position to evaluate its performance and budget. If you are considering establishing a help desk, you have the basis for an informed decision about creating your own in-house or retaining an outside provider of support services.

Next month, we'll look at calculating the costs of a help desk and evaluating its performance against the option of retaining an outside group ("outsourceing").■

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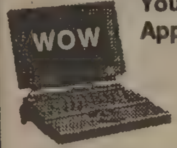

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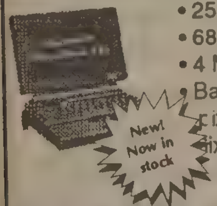

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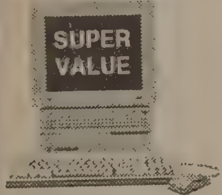

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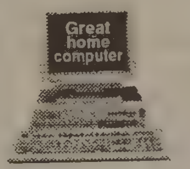

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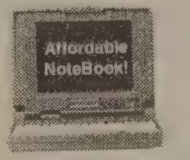


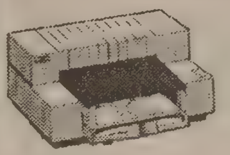
- 60 MB hard drive
- 25 MHz,386L microprocessor
- 4 MB RAM expandable to 12 MB
- 64 KB of 4-way-set-associative cache
- Windows 3.1
- DOS 5.0

$1999.99

Prolinea and Contura are registered trademarks of Compaq, Inc.

hp HEWLETT PACKARD

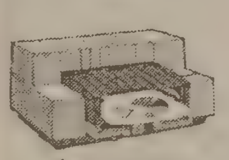
Hewlett Packard DeskWriter Printer



- 2 pages per minute
- 300 dpi
- Compatible with System 7.0 & AppleTalk
- Prints on plain paper and envelopes
- 100 page paper tray

$389.99

Hewlett Packard DeskJet 500C Printer



- 300 dpi
- prints letter and transparency size
- Scalable fonts and grayscale blacks
- 100 page paper tray

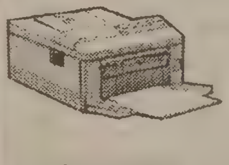
$595

Hewlett Packard LaserJet IIP Plus Printer

- 4 pages per minute
- 300 dpi output
- Prints letter, legal, A4 & excutive size paper
- Quiet and reliable
- 14 buiit-in bit mapped fonts

$798

Hewlett Packard LaserJet III Printer



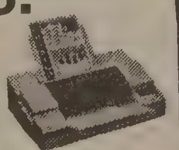
- 4 pages per minute
- 300 dpi output
- Resolution Enhancement, HP's patented solution to the "jaggies"
- Includes PCL 5 for built-in scalable typefaces
- Built-in LocalTalk interface for easy use

$989

Now Available at Computer Selection
Canon

BJC 820 Color Bubble Jet Personal Printer $2088.99

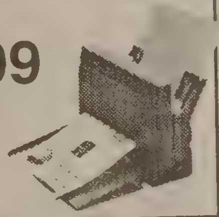
Create stunning presentations, transparencies–even posters. Prints on a variety of materials up to 11 x 17. 360 x 360 dpi. Quick, silent and easy to use.



Now Available at Computer Selection
Canon

BJ-10ex Bubble Jet Personal Printer $299

The ideal portable computer companion. Compact & light. Goes from home to office, from hotel and boardroom. Prints 83 cpi. 30 sheet paper tray. Prints on many materials. Easy to use.



COMPUTER SELECTION

Redwood City
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San Francisco
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201 Mission Street
(across from PG & E Hdqtrs)
M-F 9:30 - 5:30 Sat 10 - 4

Sunnyvale
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1202 Apollo Way
(at Central & Lawrence)
M-F 9:30 - 5:30 Sat 12 - 5

Walnut Creek
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1676 N. California Blvd
(next to Max's Opera Cafe)
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Network Products for Less!

Network Applications

CONTACT Int. ACT! v2.1 (Single Node)	236
CONTACT Int. ACT! v2.1 (2 Users)	378
CONTACT Int. ACT! v2.1 (5 Users)	788
DAC EASY Network Accounting	188
POWERCORE Network Scheduler III-DOS (5 Users)	176
Network Scheduler III-DOS (25 Users)	799
Network Scheduler III-DOS/WIN (5)	276
Network Scheduler III-DOS/WIN (25)	823
Network Scheduler III-MHS	149

- *Interfaces w/ cc:Mail for a complete solution*

Network Printing

BRIGHTWORKS PS-Print (Software)	276
CASTELLE JETPRESS BNC/10 Base-T	436
FRESH TECH Printer Assist (Software)	175
INTEL LANSpool Print Server VAP (Software)	299
INTEL LANSpool Print Server NLM (Software)	449
INTEL NETPORT II for Ethernet	544
INTEL NETPORT II for 10 Base-T	544
INTEL NETPORT II for Token Ring	775

Uninterruptible Power Supplies

APC UPS Monitor Card for NetWare	80
APC250 (200watt UPS for workstations)	140
APC POWERDOCTOR for DOS	99
APC POWERCHUTE PLUS for Novell (VAP/NLM)	99
APC SMART-UPS 400	323
APC SMART-UPS 600	411
APC SMART-UPS 900	650
APC SMART-UPS 1250	844
APC SMART-UPS 2000	1,294
International Models available	Call
ELGAR IPX1100SL (1000w)	539

- *Best Value in Battery Backup!*

Network Fax

CHEYENNE FaxServe VAP/NLM	679
INTEL NET SATISFAXTION Network Fax Software	653
OPTUS FACSys NetWare Fax Server Software	651
INTEL Satisfaxtion Modem 200	317

- *The above solutions require a fax server*

JETFAX II 9250 w/1 MB (New Lower Price)	645
JETFAX II 9450 w/ 4 MB (New Lower Price)	1,049

- *JETFAX is a complete network fax solution*

Tape Backup Solutions

COLORADO DJ-10 120MB	225
DJ-20 250MB	270
QFA-700 W/ CTRL 700 MB	1,100
TJ-10 120MB TRAKKER Parallel Port Tape Drive	395
TJ-20 250MB TRAKKER Parallel Port Tape Drive	479

- *New Product. Ideal for Laptops & Notebooks*

TALLGRASS FILESECURE 500i (500MB)	1,058
FILESECURE 1000i (1GB)	1,599
FILESECURE 1300i (2.6GB)	2,399
FS3000 INT. HIGH SPEED BACKUP (2.7GB)	2,914
FS3000 EXT. HIGH SPEED BACKUP (2.7GB)	3,174
FS4000 INT. 4mm DAT (4GB)	2,914
FS4000 EXT. 4mm DAT (4GB)	3,174
MOUNTAIN FS1200 2.0GB Int. 4MM, SCSI	3,007
MOUNTAIN FS1200 2.0GB Ext. 4MM, SCSI	3,341
MOUNTAIN FS2100 2.2GB Ext. 8MM, SCSI	4,924

Server Based Kits

ARCHIVE INT. PYTHON 1.3GB DAT w/VAP	2,300
ARCHIVE EXT. PYTHON 1.3GB DAT w/VAP	2,511
EXABYTE INT 2.2 GB 8MM w/VAP	2,706
EXABYTE EXT. 2.2 GB 8MM w/VAP	2,919
ARCHIVE INT. PYTHON 1.3GB DAT w/NLM	2,895
ARCHIVE EXT. PYTHON 1.3GB DAT w/NLM	3,106
EXABYTE INT 2.2 GB 8MM w/NLM	3,301
EXABYTE EXT. 2.2 GB 8MM w/NLM	3,514

LANtastic Products

LANtastic AE-2 Ethernet Starter Kit	475
LANtastic AE-2 Windows Starter Kit	518
LANtastic AE-3 Starter Kit	544
LANtastic 10BT Starter Kit w/Peer Hub	618
LANtastic AE-2 Ethernet Adapter	204
LANtastic AE-3 Combo Adapter	239
LANtastic 2Mbps Starter Kit	339
LANtastic/AI Adapter Independent(single node)	89
LANtastic Central Station	408
LANtastic Peer Hub	270
LANtastic for NetWare	277

SPECIALS

3COM Etherlink III Ethernet Lan Card

3COM's new Etherlink III 16-bit adapters provide parallel tasking which boosts performance up to 25% over previous cards. With 3COM's solid reputation, lifetime warranty, and extensive software support, this lan card is sure to be of great value.

3C509 Etherlink III Coax	**$140**
3C509-TP Etherlink III 10 BaseT	**$140**

HTI Networks

Buy any combination of five **HTI** 10Base-T lan cards or external parallel port adapters and get an additional ***$100 off*** the purchase of the HTI 8 or 12 port concentrator.

New Item! **HTI** Parallel Port Adapter with Pass Thru Port. Ethernet coax or 10BaseT adapter for Laptop or Notebook computers with a pass thru port for parallel connection.

Ethernet Coax or 10 BaseT	**$199**

Da Vinci Email FREE w/ NetWare Lite 1.1 Starter Kit

Novell NetWare Lite 1.1 bundle w/Da Vinci v1.7 8- user Email ($295 value). NetWare Lite 1.1 now runs up to six times faster than v1.0. Support for Windows 3.1 and CD-ROMs. Bundle includes NetWare Lite 1.1, 16-Bit coax or 10Base-T ethernet adapter, coax cable. (10Base-T requires purchase of concentrator and cables)

Single coax node	**189**
Coax Starter Kit (w/Da Vinci Email)	**378**

MacIntosh Products

3COM 3C543 ETHERLINK/NB	386
3COM 3C563 ETHERLINK/SE	321
ASANTE MC+IIE64 Coax/MAC II	222
ASANTE MC+IIET64 10 BaseT/MAC II	222
ASANTE EN/SC 10 BaseT for Powerbook	288
ASANTE FriendlyNet Print Solution	182

- *Allows Macs & Laserwriter IIg to print at Ethernet speeds*

Cabling Supplies

RG58/RG62 Rachet BNC Crimper	75
RJ-45 Crimper	75
RG58 Ethernet BNC-Crimp (100 pak)	125
RG62 Arcnet BNC-Crimp (100 pak)	125
RJ45 10 BaseT Connectors (100 pak)	40
AT&T 10Base-T Ethernet Cable (1000' min)	100
BELDEN PVC RG58 or RG62 Cable (1000' min)	175
PLENUM RG58 or RG62 Cable (1000' min)	350
MICROTEST Cable Scanner Kit	1,083
MICROTEST Pair Scanner Kit	1,807
MICROTEST Quick Scanner Kit	656
MICROTEST Ring Scanner Kit	938
MICROTEST MT340 Scanner	2,533

CD-ROMs

CREATIVE LABS MultiMedia Starter Kit	465
CREATIVE LABS Video Blaster	335
HITACHI CDR1750S Ext. CD-ROM w/interface	760
NEC CDR-84 Int. CD-ROM, 280ms w/interface	620
NEC CDR-74 Ext. CD-ROM, 280ms w/interface	712
SONY CDU-541 SCSI CD-ROM w/interface	575

Networkable CD-ROM

MICRO DESIGN Ext. CD-ROM LaserBank 600CD	750
MICRO DESIGN Int. CD-ROM LaserBank 600CD	674
MICRO DESIGN HA-16A 16-Bit SCSI Adapter Kit	373
MICRO DESIGN HA-32E 32-Bit SCSI Adapter Kit	599
MICRO DESIGN SCSI Express for DOS	223
MICRO DESIGN SCSI Express for NetWare 2.2	449
MICRO DESIGN SCSI Express for NetWare 3.11	599

Dial In/Dial Out Communications

CROSS COMM. CrossConnect 1 Modem Software	277
CROSS COMM. CrossConnect 5 Modem Software	558
CROSS COMM. CrossConnect 20 Modem Software	1,121
MICRODYNE NetWare Access Server (4-Port/BNC)	6,128
MICRODYNE NetWare Access Server (4-Port/10BT)	6,128
MICRODYNE NetWare Access Server (8-Port/BNC)	9,621
MICRODYNE NetWare Access Server (8-Port/10BT)	9,621

- *Complete Solution w/ modems & installed software. Monitor & keyboard not included*

NEWPORT ACI 8-port Async Interface for NAS	826

Network Modems

SHIVA NET MODEM/E 9600 BNC	1,699
MICROTEST Ethernet LANModem	1,699
MICROTEST Token Ring LANModem	2,210

- *MICROTEST LANModems allows connection of 2nd modem*
- *Above solutions attach directly to cabling*

U.S. ROBOTICS Modem Sharing Kit V32BIS	669
U.S. ROBOTICS Dual Modem Sharing Kit	1,072

- *Modem Sharing Kits requires non-dedicated workstation*

Disk Sub-Systems for NetWare

Micropolis 675MB w/ SCSI-2 Host Adapter, Drivers, Enclosure. 16 ms w/ 5 year warranty	**2,195**
Maxtor 675 MB w/ SCSI-2 Host Adapter, Drivers, Enclosure. 17 ms	**1,975**
Micropolis 1GB w/ SCSI-2 Host Adapter, Drivers, Enclosure. 14 ms w/ 5 year warranty	**2,605**
Micropolis 1GB Mirrored w/ SCSI-2 Host Adapter, Drivers, Enclosure. 14 ms w/ 5 year warranty	**4,635**
Fujitsu 1.7GB w/ SCSI-2 Host Adapter, Drivers, Enclosure. 11 ms w/up to 5 year warranty	**3,775**
Fujitsu 1.7GB Mirrored w/SCSI-2 Host Adapter, Drivers, Enclosure. 11ms w/up to 5 year warranty	**6,975**

Storage Dimensions

LAN1000SA-BF2 Int 1GB SCSI w/16-Bit HSA	2,775
LAN330SA-BF Int330MB SCSI w/16-Bit HSA	1,525
LAN330SE-BF2 Int 330MB SCSI w/32-Bit HSA	2,022
LAN650SA-BF Int 650MB SCSI w/16-Bit HSA	2,124
LAN2-330S1A-BF2 Ex 2x w/1-330MB & 16-Bit HSA	2,308
LAN2-650S1A-BF Ex 2x w/1-650MB & 16-Bit HSA	2,906
LAN2-650S1E-BF2 Ex 2x w/1-650MB & 32-Bit HSA	3,125
LAN2-1000S1A-BF2 Ex 2x w/1-1GB & 16-Bit HSA	3,556
LAN2-1000S1E-BF2 Ex 2x w/1-1GB & 32-Bit HSA	3,774

Micropolis Raidion 5 Disk Array

- *Each Raidion includes 3 disk drives, 3 power supplies, 3 fans, device driver for NetWare 386 and installation guide. Raidion offers RAID 5 fault tolerance, up to 10X faster performance, Novell certified device drivers, optional hot swap replacement of failed drives, & modular expansion from 680MB to 47GB. Your network continues to run even if a drive or power supply fails.*

RAIDION 680-680MB	5,625
RM340 340MB expansion module	1,878
RAIDION 1340-1.3GB	7,608
RM670 670MB expansion module	2,544
RAIDION 2060-2.06GB	9,989
RM1030 1GB expansion module	3,337
RAIDION 2680-2.68GB	12,550
RM1340 1.34GB expansion module	4,192
RAIDION 3500-3.5GB	13,880
RM1750 1.7GB expansion module	4,637
RAIDION ISA SCSI Host Adapter	357
RAIDION EISA SCSI Host Adapter	642

OPTICAL STORAGE SOLUTIONS

PINNACLE MICRO PMO-650 Int. or Ext. 650MB rewritable Optical Drive w/Netware drivers, host adapter, cables and documentation. 19ms effective access time, fast transfer rate.

PMO-650I	3,100
PMO-650E	3,145
DOT-512 Optical Cartridges	160

IOMEGA LaserSafe MO650 650MB/1.3GB rewritable Optical SubSystem

MO650	3,724
PC2B-2 PC/AT Interface Kit	147
LaserSafe Optical Disk	222
Netware Drivers	99

- **All prices listed are cash prices.**
- **All orders shipped C.O.D. from South S.F.**
- **Fortune 1000 companies and Govt P.O.s accepted on approved credit. Surcharge will apply.**

FASTLINK

Network Products

- **20% restocking fee applies to all non-defective returns and refused shipments.**
- **Shipping and handling charges will be added to all orders.**
- **Call for quotes on items not listed.**
- **Quantity pricing available for 10 units or more.**

Everything for your network & more!

Lan Cards

Arcnet

AQUILA 4-in-1 8-Bit (TP Star/Bus & Coax Star/Bus)	89
AQUILA 4-in-1 16-Bit (TP Star/Bus & Coax Star/Bus)	125
FASTLINK 4-Port Internal Arcnet Active Hub	99
FASTLINK 8-Port External Arcnet Active Hub	199
FASTLINK 4-Port Passive Hub	20
SMC PC-130 8-Bit Coax	96
SMC PC600WS 16-Bit Coax	141
SMC PC600FS 16-Bit Coax	216
SMC EISA 32-Bit Coax Arcnet or TP Arcnet	743
THOMAS CONRAD 16-BIT Coax Star/Bus	240/270
THOMAS CONRAD 16-Port Active Hub (Coax)	555
TIARA LANCARD/A Hiz Bus PC/AT	146/206

Ethernet

HTI Coax 16-Bit Ethernet Adapter	125
3COM 3C503-16 ETHERLINK II 16-bit	199
3COM 3C503-16 ETHERLINK II 5 Pack	738
3COM 3C523B ETHERLINK/MC	290
3COM 3C523B ETHERLINK/MC 5 Pack	1,263
3COM 3C507 16-BIT ETHERLINK	299
3COM 3C507 5 Pack, (1 Doc/Drivers)	1,345
3COM 3C509 ETHERLINK III 16-bit	140
3COM 3C509 ETHERLINK III 5-Pack	650
INTEL ETHEREXPRESS 16	135
INTEL ETHEREXPRESS 16 5 Pack (1 Doc/Drivers)	650
NOVELL NE2/2-32A 32-Bit MC	581
NOVELL/EAGLE NE2000 16-Bit	175
NOVELL/EAGLE NE2000 Compatible 16-Bit	155
NOVELL/EAGLE NE2/2A 16-bit Micro Channel	271
SMC ETHERCARD ELITE 16 Coax	165
SMC ETHERCARD ELITE 16 Coax 6 Pack	775
SMC ETHERCARD ELITE/A FOR PS/2	218
ACCTON 32-Bit EISA Coax/10BaseT Combo	450
EXOS/MICRODYNE 32-BIT EISA	700
INTEL ETHEREXPRESS 32-Bit EISA	580
NOVELL/EAGLE NE3200 32-Bit EISA	710
RACAL ES3210 32-Bit EISA	577

Token Ring

IBM Token Ring Adapter 16/4	555
INTEL TOKENEXPRESS ISA 16/4	537
INTEL TOKENEXPRESS EISA 16/4	698
MADGE Token Ring Adapter 16/4	620
MADGE Token Ring Adapter 16/4 (10 Pack)	5,546
MADGE Token Ring Adapter 16/4 EISA	850
THOMAS CONRAD TC4045 16/4 16-Bit..	489
THOMAS CONRAD TC4045 16/4 16-Bit (6 Pack)	2,823
■ *Other Brand Name Token Ring Cards*	*Call for prices*

10 Base-T Twisted Pair Ethernet

HTI 10 Base-T transceiver (AUI to RJ45)	89
ACCTON 10 Base-T tranceiver (AUI to RJ45)	100
RACAL 10 Base-T transceiver (AUI to RJ45)	110
■ *Converts Coax Ethernet to 10Base-T*	
HTI 10 Base-T 16-bit Ethernet Adapter	125
3COM 3C503-16TP ETHERLINK II 16 16-bit	209
3COM 3C503-16TP ETHERLINK II 16 5PK	825
3COM 3C507 ETHERLINK 16-bit TP	340
3COM 3C507 ETHERLINK 16-bit TP 5PK	1,394
3COM 3C509-TP ETHERLINK III 16-bit	140
3COM 3C509-TP ETHERLINK III 16-bit 5PK	650
3COM 3C523B 10 Base-T MC	334
3COM 3C523B 10 Base-T MC 5 Pack	1,500
ACCTON EN1640 ETHERCOMBO 16-Bit	175
AQUILA 10 Base-T 16-Bit	145
INTEL ETHEREXPRESS 16 TP	145
INTEL ETHEREXPRESS 16 TP 5 Pack	675
THOMAS CONRAD 16-BIT w/ RJ45	279
SMC ETHERCARD ELITE 16T 10 Base-T	170
SMC ETHERCARD ELITE 16T 10 Base-T 6 Pack	775
SMC ETHERCARD ELITE 16 COMBO	217
SMC ETHERCARD ELITE 16 COMBO 6 Pack	1,000

External/Pocket Adapters

ACCTON RingPocket TR Adapter	546
AQUILA Pocket Ethernet Adapter BNC	225
AQUILA Pocket 10 Base-T Ethernet (RJ45)	225
AQUILA Pocket Arcnet Adapter	195
DLINK Pocket Ethernet Adapter BNC	250
DLINK Pocket 10 Base-T Adapter	250
HTI Ext. Ethernet Adapter w/ Parallel Port	199
HTI Ext. 10 Base-T Adapter w/ Parallel Port	199
XIRCOM Pocket Arcnet Adapter TP	247
Pocket Arcnet Adapter COAX	267
External Ethernet Adapter	413
External Token Ring Adapter	649
Pocket 16/4 Mbps TR Adapter	615
Pocket Ethernet II BNC	345
Pocket Ethernet Adapter 10 Base-T	378
■ *Use XIRCOM for SL Based Notebook Computers*	

SPECIALS

FRYE UTILITIES

NetWare Management - Quickly retrieve the information you need in order to effectively manage your network. Lan-At-A-Glance provides real-time activity in graphical, numerical and text formats. Provides the utilities you need to diagnose, troubleshoot and document your network. **$324**

NetWare Early Warning System - Monitors NetWare 2.x and 3.x servers for over 50 types of common problems, many of which can be critical. Set your own thresholds for events, i.e. disk space, peak files open, etc. EWS can page you, send an E-mail or send a message to your screen notifying you of a problem on the network. EWS can also fix a problem that it encounters using the parameters you set up as custom responses. **$324**

LAN Directory - A powerful PC hardware and software inventory reporting program. Automatically audit and document every detail possible for workstations and file servers. **$278**

CASTELLE: Special pricing on LANpresses!

Castelle LANpress 2P/2S (BNC)	**$638**
Castelle LANpress 2P/2S (10BaseT)	**$638**
Castelle LANpress 1P/3S (BNC)	**$477**
Castelle LANpress 1P/2S (10BaseT)	**$477**

10 Base-T Concentrators

3COM 3C621 LinkBuilder 10BT	746
3COM 3C622 LinkBuilder 10BTI (SNMP)	1,359
3COM 3C623 Single Port BNC Module	149
3COM 3C624 Single Port Fiber Module	260
3COM 3C625 Hub Expansion Cable	59
ASANTE 1012 12-Port Smart Hub	820
ASANTE 1701 Smart Hub 12-port w/SMNP module	966
DLINK 4-port Internal 10 Base-T Concentrator	325
EAGLE 4-port Hublet Mini-Repeater	228
HTI 8-port 10 Base-T Concentrator	399
HTI 12-port 10 Base-T Concentrator	525
EXOS/MICRODYNE 16 port 10 Base-T Concentrator	660
INTEL Int. EtherExpress TPE Hub/ISA (12 ports)	565
INTEL Int. EtherExpress TPE Hub/EISA (12 ports)	639
INTEL Hub Expansion Board (12 add'l ports)	489
INTEL Harmonica for EtherExpress TPE Hub	65
■ *INTEL TPE hubs are server based*	
NETWORTH 3-Slot Chassis	606
6-Slot Chassis	788
Host 10BaseT Module	1,219
Smart 10 BaseT Module	1,772
EtherManager Software	1,220
■ *Winner of PC Magazines Editors Choice Award*	
Microhub 9-Port Concentrator	449
Microhub 8-Port + 1 BNC Conc.	469
SYNOPTICS 2800 10Base-T Workgroup Concentrator	764
2810-02 10Base-T Wg. Conc. (Basic)	1,397
2810-02A 10Base-T Wg. Conc. (Adv.)	1,817
2310-02 10Base-T Area Conc. (Basic)	3,849
2310-02A 10Base-T Area Conc. (Adv.)	5,110
Adv. Ethernet/TR Control Console SW	2,621

Repeaters

ACCTON EtherRepeater 2 AUI/2 BNC	685
IMC LANextender BNC/BNC-limited to 1 per lan	325
IMC Dual Port Ethernet Repeater BNC/BNC	599
IMC Quad Port Repeater (BNC/BNC + AUI/AUI)	625
IMC Multi-Port Repeater Chassis	618
IMC BNC Repeater Card for IMC Multi-Port Repeater	250
IMC 10BT Repeater Card for IMC Multi-Port Repeater	150

E-Mail w/ cc:Mail

cc:MAIL DOS Platform V4.0	223
OS/2 Platform	377
WINDOWS Platform	377
MacIntosh Platform	377
Lan Package + 10 USERS	253
Lan Package + 25 USERS	622
Lan Package + 100 USERS	2,395
Gateway	899
Remote	205
Fax	1,385
Fax View	690
Link to SMTP	2,079

Network Utilities

BRIGHTWORKS Emonitor	205
SiteLock	345
LAN Inventory	474
LANserver Watch(100 Users)	465
LANserver Watch(250 Users)	1,010
CHEYENNE Monitrix Network Mgmt.	595
Utils for NetWare 286/386	262
ARCserve NLM V4.0 (up to 5 users)	273
ARCserve NLM V4.0 (up to 20 users)	810
ARCserve NLM V4.0 (up to 50 users)	1,018
ARCserve NLM V4.0 (up to 250 users)	1,295
ARCserve VAP V4.0 (5 users)	218
ARCserve VAP V4.0 (10 users)	511
ARCserve VAP V4.0 (any users)	879
ARCserve Solo	185
InocuLAN VAP (5 Users)	248
InocuLAN NLM (20 Users)	312
InocuLAN NLM (250 Users)	628
InocuLAN 5 User Increase for VAP/NLM	175
SABER Menu for DOS-10 users	142
Menu for DOS-25 users	281
Menu for DOS-100 users	963
Menu for DOS-250 users	3,725
LAN Admin Pack-10 users	224
LAN Admin Pack-25 users	395
LAN Admin Pack-100 users	1,417
LAN Admin Pack-250 users	3,405
DIRECT ACCESS Network Menu	366
FRESH TECH Lan Assist Plus	204
Map Assist	226
Modem Assist	338
NetVision	407
FRYE UTILITIES NetWare Management v1.1	324
NetWare Management Add'l License	276
Early Warning System v1.1	324
Early Warning System Add'l License	276
Early Warning System Pager Option	195
Early Warning System cc:Mail Option	195
Early Warning System Fax Option	259
Lan Directory v1.1	278
Lan Directory Add'l License	276
INTEL LANProtect Virus Protection	740
LANSight Support	307
LANSchool	435
NetSight Sentry for Ethernet	1,549
ONTRACK NetUtils v3.0	216
TOUCHSTONE CheckIt LAN (5 computers)	141
TOUCHSTONE CheckIt LAN (20 computers)	277
XTREE XTNET Network File Manager	305

Novell Software

NetWare Lite New Version 1.1	69
DR DOS Lan Pack (5 Users)	299
DR DOS Lan Pack (10 Users)	535
DR DOS Lan Pack (20 Users)	938
DR DOS Lan Pack (50 Users)	2,015
DR DOS Lan Pack (100 Users)	3,361
DR DOS Lan Pack (250 Users)	6,725
LANalyzer for NetWare	685
LANtern Ethernet Network Monitor	3,385
LANtern LTD Network Manager	1,811
LANtern Services Manager	3,629
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News From Netucon

Innovations, Shipping And Otherwise

BY YACCO

LOCAL AREA NETWORKS

To many early computer enthusiasts, the attraction of the original West Coast Computer Faire was that it attracted developers willing to show their plans and ideas to ordinary end-users well before they were ready for market. People took pleasure in the latest tricks and gadgets, and made their wish lists, ordered stock for their shops, or offered to invest.

Then, Stewart Alsop coined the term "vaporware," and institutionalized the ridicule of products that didn't ship until long after they were promised. Nothing wrong with that if it's reserved for the long-overdue products that deserve it. Unfortunately, not everyone who derides a product as vaporware has gotten that point, and it's hard to predict development exactly (almost no one can do it).

So, many companies have decided there's too much risk in showing products before they are ready to ship. Investors, resellers, analysts, and editors like Alsop still get to see the early ideas (deals must still be made and funds acquired), but behind closed doors and under nondisclosure. As a result, regional shows like the Computer Faire turned into glorified flea markets about four or five years ago, and the rest of the community now must now wait for the Alsops of the world to publish. (Isn't it ironic how that worked out?)

Fortunately, there are some regional shows where end-users wanting the cutting edge of technology can still find it. Netucon, the regional conference for NetWare Users, is such a venue. Although it's tiny by comparison with the Computer Faire, the Los Angeles Netucon held last month featured two products being shown in beta. One looked like a contender for most-innovative-groupware honors, and the other was what its developers (as well as some analysts) are calling the first LON product ready for market—and it almost is.

OFFICE.IQ

First the groupware. Office.IQ, a product exhibited by Portfolio Technologies, Inc., goes well beyond the integration of electronic mail and scheduling in typical collaborative software. The heart of the system is email, but it's email of documents being worked on by a group, and it's automatic. When you finish a step on a particular type of document, you drag it to your outbox. As soon as you drop it, it appears in the inboxes of one or more recipients who are responsible for the next step in the workflow.

Actual workflow is controlled in another window by manipulating a graphical representation of the system. Users appear as nodes in the network, and incoming and outgoing links determine who passes what to whom. The nodes and links are easily manipulated as objects. New configurations can be created simply by dragging parts of the network. On the surface, it looks like a natural extension of the workgroup metaphor, and a killer application.

The Office.IQ announcement is planned for Networld. (Of course, it's getting announced unofficially right now. So, that may change.) It's expected to ship in November for under $500 a node, in packs of at least five nodes. But if it ships thirty, sixty, or even ninety days later, so what? It'll still be terrific. Windows shipped years late, and nobody's laughing except Gates.

CENTRUMREMOTE

Centrum's Remote Access Server is a LON (LAN Outer Network) product. In other words, its combination of hardware and software lets you connect users (up to sixteen) to your LAN from the field. Connections are made using asynchronous analog lines, or T1 digital services. Users experience their LAN connection as if they were connected directly to the LAN with an adapter, but there's no adapter or even the wire to connect to one.

Shiva's NetModem products, for example, have provided remote dial-in network access for the Mac since 1987, and for the PC since 1992 (with the introduction of the NetModem/E). However, the NetModems, as well as the more recent LanRover/L which supports Apple's Remote Access protocol, are single-port products. They were among the first products to make a remote client act like a local node connected to the network, but they only support one user per device. Centrum supports up to sixteen.

Another competitor is the NetWare Access Server by Microdyne, which began shipping in April. However, while the remote user of this system experiences a session as though connected directly to the network, processing is done by dedicated Access Server hardware. Only screen refreshes and keystrokes are transmitted to the node using Novell's OnLAN PC (no Windows yet) or OnLAN Mac.

The CentrumRemote system uses software running on the remote client, and a combination of software and hardware on the Remote Access Server (RAS) side. Nevertheless, client processing works just like it would if the remote node were directly connected to the LAN. Although the client, a laptop for instance, doesn't have a NIC (network interface card) installed, there's an emulation to make its network redirector think that it does. The laptop uses Centrum's NIC emulator (60K, 0K if loaded high) to redirect network traffic to the asynch port. Traffic is sent out via an asynch modem attached, over public switched analog lines, to another modem attached to the RAS. It's the RAS that's actually connected to the network.

Inside the RAS, there are two half-routers that connect the local and remote segments. One of these devices is done in hardware, and the other in software. There's also a node emulator connected to a proxy network that, talks to the software half-router. The point of all the software is to make the true half-router, which is actually connected to the network, think it's talking to another half- router.

Novell's IPX network layer is run in the node emulator. When packets come in from the remote client, the node emulator strips off the asynch protocol and turns the packets into 802.3 Ethernet packets. It adds its own network address as though it were the laptop client's address. When it sends traffic to the remote, the node emulator strips all the IPX protocol except the SMB (Microsoft Server Message Block) calls, and the data, from the packets. Traffic is somewhat reduced.

The system seems to work well. I was able to observe it at Netucon running remotely from a desktop workstation. (Oddly enough, while the company had a BCC Avanti notebook on one counter, it wasn't being used in demonstrations.) We dialed into the network (9600bps over an asynch modem), attached to the server, started Excel locally, and loaded a spreadsheet from the server. It worked just like it would if you were actually attached through a NIC on the wire. No remote-control software or procedure was required.

Fortunately, Centrum did not share Portfolio's dilemma. The RAS was shown as a product for the first time at the Los Angeles Netucon, but it had been announced two weeks earlier. (It had been shown even earlier as a technology demo at the Netucon held in San Jose this July.) Units are expected to ship by mid-September.■

RESOURCES:

Office.IQ
Portfolio Technologies, Inc.
5600 Mowry School Rd., Ste. 100
Newark, CA 94560
(510)226-5678

CentrumRemote Remote Access Server
4 ports, $3495
16 ports, $6295
(Asynch available in increments of four ports up to sixteen. A pair of T1 ports are not yet priced, but expected to be under $4000)
Centrum Communications
2880 Zanker Rd.
San Jose, CA 95134
(408)894-1800

NetModem V2400, $499
NetModem V32, $1189
NetModem/E, $1699
LanRover/L, $699
Shiva Corp.
One Cambridge Center
Cambridge, MA 02142
(617)252-6300

NetWare Access Server
4-port Ethernet, $8995
4-port Token Ring, $9695
8-port Ethernet, $13995
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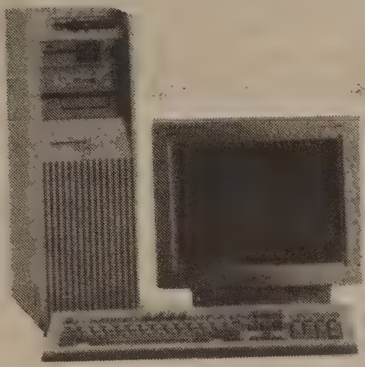

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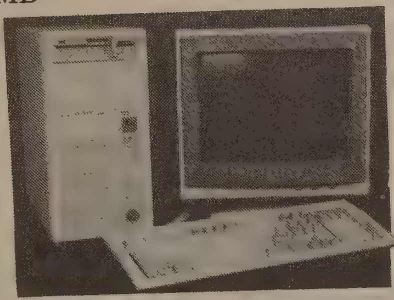

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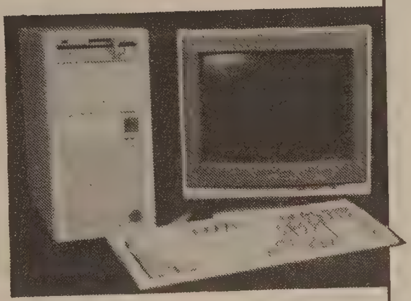

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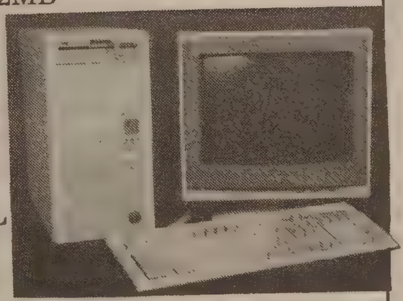

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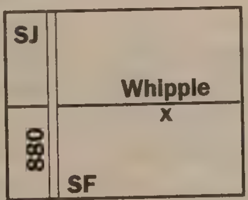

MINIX Is Not UNIX, Either

A Lookalike For Low-End Hardware

BY BENNETT FALK

We live in a culture that is preoccupied with productivity, and this is making us dull.

What is dull? Until the Postal Service delivered a box of new software last week, this column was going to be about lpr, the UNIX printer spooler, and how to set up printers.

The software that arrived is MINIX, Version 1.5, and it is not dull. MINIX is a UNIX lookalike operating system created by Andrew Tannenbaum and a host of others. (See Tannenbaum's book *Operating Systems: Design and Implementation*, Prentice Hall, ISBN 0-13-637406-9 for an earlier view of the project. MINIX itself is available from Prentice Hall.)

WHAT IS MINIX?

[illegible]

UNIX

[illegible] bought, and its corollary, that we become productive just by spending the money.

MINIX is not a productivity tool in the conventional sense. It has no Graphical User Interface. It has neither job control nor the ability to log in multiple sessions from the system console. It doesn't have either the C-shell or the Korn shell. Nor does it have much at all to do with the versions of UNIX that are marketed so aggressively to the business community.

In spite of its productivity handicaps, MINIX thrives. It is enough like UNIX to feel familiar to UNIX users, but similarity to UNIX is hardly the point of the operating system, and discerning the intentions of the system's authors is part of the fun of using MINIX.

Like UNIX, MINIX was designed to be portable to different computer architectures. The version tested was for the IBM PC, but MINIX has also been ported to Atari, Amiga, Macintosh, and Sun. MINIX is almost certainly the only software product (let alone operating system) shared by all these platforms.

Like UNIX, MINIX is a cultural phenomenon as well as a piece of software. The USENET newsgroup in which MINIX is discussed has many contributors and is widely read, and these discussions about MINIX and its use have an effect on its future development. The posting to the USENET newsgroup is probably the most efficient way to get answers to questions about MINIX.

MINIX is essentially an open-ended software education project. Users who expect to learn UNIX command syntax from MINIX will probably be disappointed; those who want to learn something about how operating systems in general work and what goes on behind the scenes will probably find their interactions with MINIX very gratifying.

A SHORT TOUR

The simple act of booting MINIX from a floppy disk invokes interesting technology: the [illegible] ernel economizes on hardware by [illegible] filesystem on a RAM [illegible] el in the root directory; it and several other critical programs are loade[illegible] into memory from a bootable diskette that contains only those programs and no filesystem. It's not clear where or how swapping is done: no disk partition is reserved for a swap area.

On machines with IBM-PC keyboards, the F1 and F2 keys display system information that would require running the "ps" command on a regular UNIX system.

MINIX includes a C compiler like any good UNIX system, and the C source code for the OS is also part of the distribution. There are also lots of support tools for programmers: editors for every taste (clones of vi and EMACS and a MINIX editor called mined), an 8088 disassembler (with the Intel version), a debugger with the 68000 version, the M4 Macro processor, a version of awk, and a disk editor.

The system includes a network protocol borrowed from the Amoeba distributed operating system, and this can be used to bring a MINIX-based system up on an Ethernet-based network or to build and debug client/server programs. There are also utilities to support transfer of files across the network.

A number of utilities that are not part of conventional UNIX systems are included with MINIX: Kermit and ZMODEM file transfer utilities are included to facilitate exchanging files with personal computers. Curiously, UUCP, the UNIX file transfer system, is missing. The utilities bundled with the system include versions of programs from AT&T UNIX, Berkeley UNIX, and the public domain.

BENCHMARKING MINIX

MINIX is a 16-bit operating system (a 32-bit version that can use modern processors more effectively is in the works), and its performance is not outstanding. It is in general slower than the 16-bit version of Coherent, another UNIX lookalike produced by the Mark Williams Co. A modified version of the now-ancient Byte Benchmarks (first published by David Hinnant in *Byte* in 1983) were run on MINIX, and Tables 1-4, below, show the re[illegible] ts were run on a 25 MHZ [illegible] notebook computer with 8 MB memory and an 80387 coprocessor. The other systems tested used a 16MHz Wyse 386 PC with an 80287 math co-processor.

The tests that were run fall into four categories. The CPU intensive tests measure speed of computation ("sieve"), system call efficiency ("scall"), looping efficiency ("loop"), and the overhead involved in using function calls ("fcalle") in place of simple assignments ("fcalla"). The disk intensive tests measure disk read ("dread"), disk write ("dwrite") and pipe throughput ("pipes"). The "shell" test measures the system's multi-user capacity by running up to six concurrent sessions. Finally, the time required to compile the C source code for the other tests is included as a general measure of compiler efficiency.

MINIX performs unexceptionally on most of these tests (its good performance on the sieve benchmark almost certainly owes more to the coprocessor than to the design of the software). It is of some interest that MINIX is marginally faster than Coherent on the multiuser tests.

MINIX is not for the timid. Installing it was relatively painless, but there were some problems initializing the RAM disk from a hard

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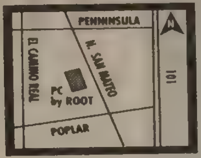

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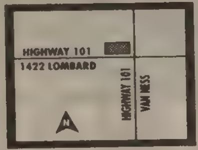

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disk partition. The “ps” command to display process activity was unable to access some of the kernel information it needed, and the vi clone (“elvis”) crashed periodically with a cryptic two-word message: “Alarm clock.”

MINIX 1.5 has been in circulation for a while. Future releases of MINIX will probably move the system into the 32-bit world and also make it comply in part with the various standards emerging in the UNIX community (ANSI C for the C compiler, POSIX for the operating system). But compliance will almost certainly be a relative thing. As the historical note in the introduction to the documentation points out, “Making MINIX fully conformant would defeat the goal of having a system that is small enough that people can actually understand it.” ■

TABLE 1: CPU INTENSIVE TESTS

	XENIX	UNIX	Coherent	MINIX
	2.1	3.2.2	3.2	1.5
	2MB	6MB	6MB	8MB
Executing fcalle				
	0.34	0.32	0.41	0.6
	0.2	0.2	0.4	0.5
	0	0	0	0
Executing fcalla				
	0.13	0.12	0.2	0.4
	0	0	0.1	0.27
	0.01	0	0	0
Function Call Overhead	0.21	0.20	0.21	.20
Executing loop				
	1.8	1.91	3.52	7
	1.7	1.8	3.21	6.97
	0.03	0.04	0.04	0
Executing scall				
	2.45	3.04	3.00	6.8
	0.25	0.32	0.29	0.83
	2.13	2.65	2.66	5.9
Executing sieve (100 iterations 1899 primes)				
	9.05	10.42	9.64	5.2
	8.9	10.28	9.41	5.2
	0.04	0.03	0.01	0

TABLE 2: DISK INTENSIVE TESTS

	XENIX	UNIX	Coherent	MINIX
	2.1	3.2.2	3.2	1.5
	2MB	6MB	6MB	8MB
Executing dwrite				
	0.33	0.5	1.86	3.4
	0	0	0	0
	0.25	0.24	0.51	0.4
Executing dread				
	0.65	0.35	0.67	0.5
	0	0	0.06	0
	0.23	0.26	0.27	0.24
Executing pipes				
	1.23	1.28	2.17	2.7
	0	0	0.01	0.01
	0.53	0.62	1.29	1.55

TABLE 3: MULTI-USER TESTS

	XENIX	UNIX	Coherent	MINIX
	2.1	3.2.2	3.2	1.5
	2MB	6MB	6MB	8MB
Shell 1				
	2.47	1.83	3.63	3.3
	0.08	0.1	0.14	0.1
	0.6	0.58	0.75	0.46
Shell 2				
	2.18	2.66	7.12	5.9
	0.18	0.19	0.28	0.24
	1.2	1.11	1.37	0.86
Shell 3				
	3.45	3.76	10.27	8.8
	0.18	0.34	0.37	0.37
	1.86	1.62	2.08	1.21
Shell 4				
	3.86	4.59	14.28	12.1
	0.31	0.43	0.54	0.54
	2.32	2.29	2.79	1.46
Shell 5				
	4.77	5.74	17.73	16.3
	0.38	0.6	0.63	0.59
	2.91	2.9	3.45	1.75
Shell 6				
	5.71	6.71	21.21	19.8
	0.48	0.68	0.72	0.72
	3.53	3.6	4.18	2.07

TABLE 4: COMPILER TEST

	XENIX	UNIX	Coherent	MINIX
	2.1	3.2.2	3.2	1.5
	2MB	6MB	6MB	8MB
Compiling dwrite.c				
	4.76	4.1	7.01	9.9
	1.11	1.14	0.71	3.81
	1.39	1.18	0.94	0.63
Compiling dread.c				
	3.4	3.45	7.18	10.3
	1.11	1.17	0.85	4.26
	1.12	1.15	0.93	0.7
Compiling fcalle.c				
	2.81	2.6	4.69	5.4
	0.7	0.54	0.18	1.05
	0.99	0.86	0.73	0.35
Compiling fcalla.c				
	2.62	2.58	4.63	5.4
	0.57	0.45	0.13	0.98
	1.03	0.84	0.68	0.34
Compiling loop.c				
	2.83	2.92	6.4	8.7
	0.65	0.57	0.44	3.2
	1.07	0.98	0.86	0.56
Compiling pipes.c				
	3.1	3.16	6.56	9.2
	0.94	0.86	0.59	3.69
	1.08	1.02	0.9	0.61
Compiling scall.c				
	2.73	2.51	4.71	5.1
	0.62	0.41	0.1	0.95
	1.02	0.82	0.67	0.32
Compiling sieve.c				
	3.01	3.29	6.9	9.4
	1.07	0.96	0.65	3.62
	1.04	0.9	0.89	0.66

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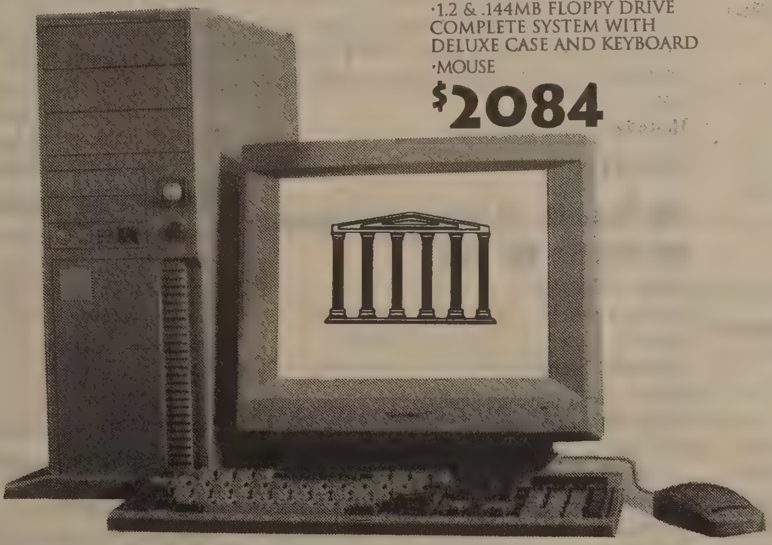

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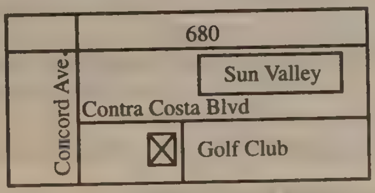

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Preview:

AIX EXPO '92

October 19–23, 1992
San Jose Convention Center
San Jose, California

AIX Expo '92 is devoted exclusively to the AIX operating system and the POWER architecture of the RISC System/6000. AIX EXPO '91 drew a turnout of more than thirty-three hundred management and technical decision-makers.

The RISC System/6000 has gained outstanding user acceptance in less than two years. Agreements announced for the PowerPC™ by Apple, IBM, and Motorola will propel the computer industry into a new era. Open systems will gain new meaning as Macintosh® and POWER-based architectures merge and extend their reach across a broad range of platforms. Thousands of attendees at AIX EXPO '92 are expected to take advantage of the opportunity to keep up-to-date on the latest developments that signal major changes for the computer industry in the decade of the '90s.

In addition to a full range of conferences and keynotes, AIX Expo '92 will feature exhibits, user group meetings, BOF (Birds of a Feather) sessions, and hands-on labs and classes.

For registration and other information, call The Conference Group, 1-800-247-0262.a turnout of more than thirty-three hundred management and technical decision-makers.

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For registration and other information, call The Conference Group, 1-800-247-0262.

CONFERENCE SCHEDULE
GENERAL SESSIONS
KEYNOTE ADDRESS

POWER Technology & Market Directions

William J. Filip
IBM Vice President & President
IBM Advanced Workstations Division

This presentation will provide insight into the future direction for POWER-based RISC technology and the market opportunities it will serve.

Tuesday, 11:00 am–Noon

Plenary I

Annual Report From the POWER Board

Apple Computer
IBM
Motorola

The "Apple/IBM/Motorola alliance" has progressed as milestones have been reached and the initiative is gaining momentum within the industry. Executives from Apple Computer, IBM, and Motorola representing the "POWER Board" will review the achievements and status of the alliance.

These presentations will be followed by a moderated question and answer period with the audience.

Wednesday, 11:00 am–Noon

Plenary II

Ask IBM Open Forum

Phil D. Hester
Vice President
Systems Technology
IBM Advanced Workstations Division
Jeff W. Mason
Advanced Workstations & AIX Systems
Director
IBM United States
Donna S. Van Fleet
Software Development Director—RISC Systems
IBM Advanced Workstations Division

This forum will provide an opportunity in a free-form "open" question and answer session to ask "where, when and why" from a panel of IBM executives responsible for AIX and RISC System/6000 strategies.

Thursday, 11:00 am–Noon

Plenary III

The Realities of Distributed Computing with the OSF DCE

Alfred Z. Spector
President & CEO
Transarc
Lloyd Westbrook
Director Information Architecture
Charles Schwab & Co

Distributed computing with OSF DCE has arrived. This session will present key considerations and planning issues relative to implementing the DCE. The Charles Schwab & Company and its activities in rolling out Transarc's DCE-based Encina OLTP solutions will be profiled.

Friday, 11:00 am–Noon

Management Seminars

Day 2—Tuesday, October 20, 1992

Seminar I

Creating New Values With Enterprise-Wide Computing Architectures

Brian Jeffery
Managing Director
International Technology Group
Michael Erbschloe
Vice President Advisory Services
Computer Economics

IS Infrastructures

The growing importance of IS infrastructures and the major challenges for today's IS manager, including PC/LAN integration, LAN/WAN interconnection, multivendor connectivity, open networks, and enterprise systems/network management will be addressed. New approaches that can reduce IS costs, create value-added services, and enable powerful new applications will be presented.

Tuesday, 8:30 am–9:30 am

Technology Management Strategies

An objective review of the major new architectures and technologies with highlights of their respective strengths and weaknesses will be provided. New methods of "technology insertion" and insight into ways that IS professionals and users can work together to identify innovative technology-driven business opportunities will be presented.

Tuesday, 9:45 am–10:45 am

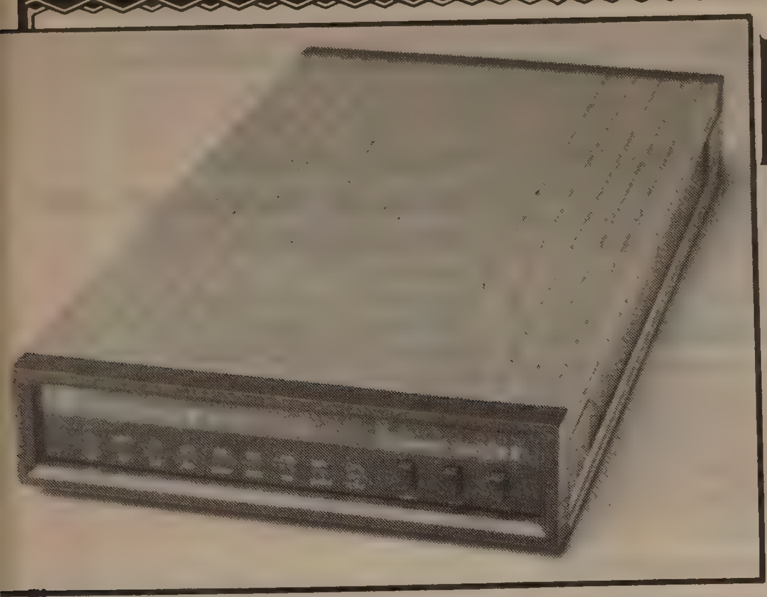
Comparative Spending for Distributed Architectures

An increasing proportion of central MIS budgets are allocated to the acquisition and support of distributed systems. The findings of the Computer Economics-sponsored survey of MIS budget allocations and an overview of how spending patterns for computer equipment are changing in major industry sectors will be presented.

Tuesday, 2:00 pm–3:00 pm

Practical Implications of Open Systems

A pragmatic look at the subject of "open systems," defined to include issues like multivendor connectivity and interoperability, applications portability, standards, use of UNIX, and software portability and productivity will be taken. It will examine open



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systems as a means of integrating proprietary and UNIX-based architectures as a way of optimizing existing IS investments and improving productivity.

Tuesday, 3:15 pm–4:15 pm

Seminar II

AIX CASE

IBM Canada

Toronto Laboratory

AIX CASE Strategy & Directions

Challenges facing CASE customers and application developers will be explored. IBM's positioning of the AIX CASE Cluster as a player in UNIX and the significance of IBM's AIX CASE announcements will be discussed. IBM's accomplishments in AIX CASE and its future direction will be presented to assist software tool vendors in planning for AIX CASE product support.

Tuesday, 8:30 am–9:30 am

AIX SDE WorkBench/6000 —

IBM's AIX CASE Framework

A detailed look at AIX SDE WorkBench/6000, which provides the basis for an integrated Software Development Environment (SDE) via visual and control integration services will be presented. Also discussed will be the companion product, AIX SDE Integrator/6000, which allows developers to integrate new and exciting tools to use the SDE WorkBench/6000 services.

Tuesday, 9:45 am–10:45 am

AIX CMVC/6000 - Configuration Management Tool

IBM's AIX CMVC/6000, which provides version management, configuration management, and change control will be reviewed. It integrates support for these services with a problem tracking facility, a configurable report facility, and a project communication facility which makes use of UNIX email. A client-server application, it allows software developers to control change and better manage their software development process.

Tuesday, 2:00 pm–3:00 pm

Integrating a CASE Tool Into IBM's AIX CASE Framework

Requirements for integrating a vendor's software tool product with AIX Software Development Environment (SDE) WorkBench/6000 will be described. Information on the support programs available from IBM to assist and guide vendors through the integration process will be given.

Tuesday, 3:15 pm–4:15 pm

Seminar III

Installation, Customization, Service & Support for the RS/6000

Linda K. Paige

Manager

AIX Systems Support Center

IBM United States

Kathleen Boyd

Senior Engineer

Center for Customer Solutions

IBM United States

Nick C. Comsudi

Manager AIX Software Services

IBM Advanced Workstations Division

Installing the RS/6000

The focus will be on the AIX Systems Support Center's unique perspective for service and support. This is the focal point for early and ongoing support of AIX V3 and the RS/6000. Assistance offered for product configuration, installation and usage will be covered. Support includes consulting services, porting and migration, and programs such as /AIXtra to help meet our customers' needs.

Tuesday, 8:30 am–9:30 am

Customizing the RS/6000

Customization services from the RS/6000 Center for Customer Solutions (CCS), part of IBM Austin manufacturing, for the RS/6000 to meet customer requirements prior to shipping will be covered. This includes the installation of both IBM and customer software as well as IBM and OEM equipment.

Tuesday, 9:45 am–10:45 am

Service & Support for the RS/6000

A detailed presentation covering the AIX Defect Support Center in Austin will be given. AIX V3 for the RS/6000 requires a support methodology that is flexible and meets changing customer demands. The focus will be on response to customers' service requirements, preventative/corrective service mechanisms, AIX V3 software enhancements support as well as future service and support directions.

Tuesday, 2:00 pm–3:00 pm

What IBM Can Do for You & Your RS/6000

Overall service and support IBM delivers from planning to installation to maintenance for the RS/6000 will be summarized. IBM's "POWER Service & Support Team" will lead an interactive discussion to answer questions and provide guidance to make sure your RS/6000 installation is "all it can be and more."

Tuesday, 3:15 pm–4:15 pm

Seminar IV

Enterprise & Personal Computing Initiatives

Apple Computer

IBM

Motorola

As an alliance of leaders in the industry, Apple Computer, IBM, and Motorola have entered into agreements involving product technology development targeting enterprise computing and personal computing environments. In a four-session seminar conducted by staff members from these companies, major areas of cooperation will be addressed: Enterprise Networking, PowerPC Implementations, Personal Computing Directions, and Technology Futures.

Enterprise Networking

Tuesday, 8:30 am–9:30 am

PowerPC Implementations

Tuesday, 9:45 am–10:45 am

Personal Computing Directions

Tuesday, 2:00 pm–3:00 pm

Technology Futures

Tuesday, 3:15 pm–4:15 pm

Track Sessions

Open Enterprise Track

Open Enterprise Solution for SAA/AIX to Integrate Information Systems

John R. Babb

Director Distributed Systems Architecture

IBM Programming Systems

Wednesday, 8:30 am–9:30 am

UNIX on the Mainframe With IBM's OSF/1-Based AIX/ESA

Janet Early

AIX High-End Systems Manager

IBM Enterprise Systems

Wednesday, 9:45 am–10:45 am

Parallel Server Technology for High Availability Clustered Multi-Processing 6000 Environments

Michael Kennedy

RDBMS Product Manager

Oracle

Wednesday, 2:00 pm–3:00 pm

SNA Connectivity for LAN Clusters to Host Environments

Dr. Alfred E. Magnus

Product Manager

Systems Strategies, Inc.

Wednesday, 3:15 pm–4:15 pm

Enterprise-Wide Integration with Distributed Application Environment

Mark Waldrep

President

Datatrend, Inc.

Thursday, 8:30 am–9:30 am

On-Line Transaction Processing (OLTP) With Encina & AIX/CICS

Alfred Z. Spector

President & CEO

Transarc

Thursday, 9:45 am–10:45 am

Cooperative Database Server Technology for the RS/6000

Deepak Puri

International AIX Product Line Manager

Oracle Corp.

Thursday, 2:00 pm–3:00 pm

Image Enabling Open Systems Solutions

Dan Cerutti

Vice President Open Systems Development

Wang Laboratories, Inc.

Thursday, 3:15 pm–4:15 pm

CICS Application Migration to the RS/6000

Tony Storey

Sr. Technical Staff Member

IBM United Kingdom

Hursley Laboratory

Friday, 8:30 am–9:30 am

Distributed Object Management Environments on the RS/6000

Don Middleton

President

Theo Peterson

Vice President Development

Suite Software, Inc.

Friday, 9:45 am–10:45 am

Technical Computing Track

Technical Computing Directions

Brooks Freeman

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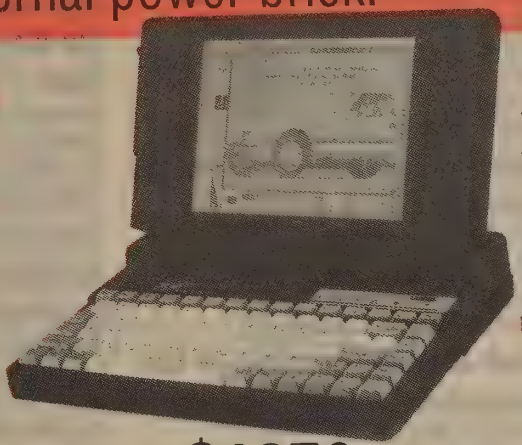

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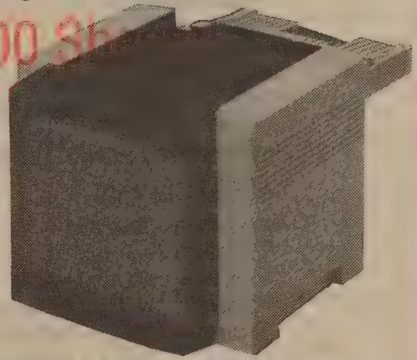

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Director Technical Computing Systems
IBM United States
Wednesday, 8:30 am–9:30 am

Technical Computing Systems Services Offerings

Frank Hatchett
Manager High Performance Computing Services
Technical Computing Systems
IBM United States
Wednesday, 9:45 am–10:45 am

UniTree – the Virtual Disk System

Mike Hardy
Product Manager
DISCOS Division
General Atomics
Wednesday, 2:00 pm–3:00 pm

RS/6000 Network Performance to the Mainframe

Kent Bossange
Director Marketing
Ultra Network Technologies
Wednesday, 3:15 pm–4:15 pm

Network Queueing Software for Heterogeneous Networked Systems

Dr. Richard E. Hessel
NQS Project Manager
Sterling Software
Federal Systems Group
Daniel O. Cummings
President
The Cummings Group
Thursday, 8:30 am–9:30 am

Programming Clusters of Workstations with Express

Dr. Jon Flower
President
ParaSoft Corp.
Thursday, 9:45 am–10:45 am

Portable Parallel Programming for RS/6000 Clusters

Dr. Andrew Sherman
Vice President
Technology Development
SCIENTIFIC Computing Associates, Inc.
Thursday, 2:00 pm–3:00 pm

Analysis of LAT & TCP/IP Performance

James Corrigan
President
Ki Research, Inc.
Thursday, 3:15 pm–4:15 pm

Optical Technology

James V. Taggart
Product Manager
Alphatronix
Friday, 8:30 am–9:30 am

RAID-Based Storage Subsystems

Tony Razouk
Manager Strategic
Opportunities Programs
ADSTAR
Friday, 9:45 am–10:45 am

Techniques & Tools Track

Series/1 to RS/6000 Migration
Wayne Johnson
Director
Datatrend Software, Inc.
Wednesday, 8:30 am–9:30 am

Commercial Multiuser System Migrations to the RS/6000
Robert "Buck" Buchanan
Migration Project Manager
The Lockwood Association, Inc.
Wednesday, 9:45 am–10:45 am

UNIX to RS/6000 Migration

Charlie Rundles
AIX Vendor Technical Support
IBM Application Solutions
Wednesday, 2:00 pm–3:00 pm

High-Level Solutions for Integrating the Macintosh Into RS/6000 Installations

Garth Conboy
President
Pacer Software, Inc.
Wednesday, 3:15 pm–4:15 pm

Installation & Support Requirements for High Availability Cluster Multi-Processing/6000 Environments

George Linscott
Vice President
CLaM Associates, Inc.
Thursday, 8:30 am–9:30 am

Open Systems COBOL Development on AIX

Colin Bodell
Assistant Vice President
Customer Engineering
Micro Focus
Thursday, 9:45 am–10:45 am

Object Databases as a Foundation for Distributed AIX Applications

Timothy Andrews
Chief Technical Officer
ONTOS, Inc.
Thursday, 2:00 pm–3:00 pm

GainMomentum With Interactive Multimedia on the RS/6000

Thomas M. Siebel
CEO
Gain Technology, Inc.
Thursday, 3:15 pm–4:15 pm

Device Driver Development for the RS/6000

George Durden
Project Leader
Device Driver Development
Pencom Software
Friday, 8:30 am–9:30 am

Backup Strategies & Options for the RS/6000

Sue M. Dintelman
President & CEO
DMS Systems, Inc.
Friday, 9:45 am –10:45 am

Industry Applications Track

Application Development for a Complete Business Solution

Mark Hagan
IBM Strategic Relationship
Manager
Progress Software Corp.
Wednesday, 8:30 am–9:30 am

Document Retrieval for Networked Computing Environments

Barry A. Goss
Director Marketing
Verity, Inc.
Wednesday, 9:45 am–10:45 am

Integrating Imaging in Financial Applications

Don Goodman
Director Marketing
Computron Technologies
Wednesday, 2:00 pm–3:00 pm

Collaborative Document Processing in a Distributed Computing Environment

Barry Obrand
Executive Vice President Marketing
Xerox X Soft
Wednesday, 3:15 pm–4:15 pm

Building Success by Rightsizing Commercial Business Applications

Mark Galloway
Product Marketing Director
Lawson Software, Inc.
Thursday, 8:30 am–9:30 am

Computer-Based Training for RS/6000 Office Automation

Susan T. Ross
Director
Pan-European Courseware
Thursday, 9:45 am–10:45 am

Addressing the Commercial Market With the RS/6000

Gordon L. Dickens
CEO
Thomas E. Davis
President
Dickens Data Systems
Thursday, 2:00 pm–3:00 pm

Applications Impact of RS/6000 Technology

William Gage
General Manager
Pencom Software
Thursday, 3:15 pm–4:15 pm

OCR With Artificial Intelligence for the IBM RS/6000

Harry L. Freer
Vice President
Integrated Computer Equipment, Inc.
Friday, 8:30 am–9:30 am

Optical Jukebox Applications for IBM RS/6000 Systems

Liz Davis
Vice President Sales & Marketing
Ten X Technology
Friday, 9:45 am–10:45 am

CASE Track

Using Object-Oriented Analysis & Design

for Today's Applications

Barry J. Ackerman
Manager Product Marketing

Continued on page 256

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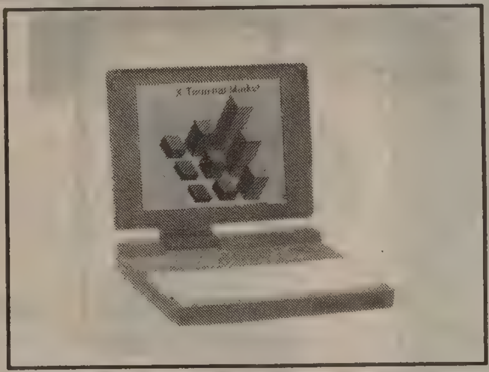

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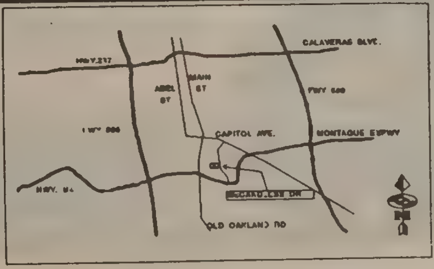
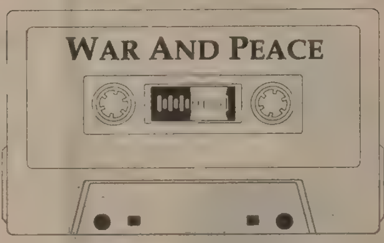
- All returns subject to 15% restocking fee and cover only Wedge Technology brand computers, excludes peripherals and software. No refunds after 30 days.

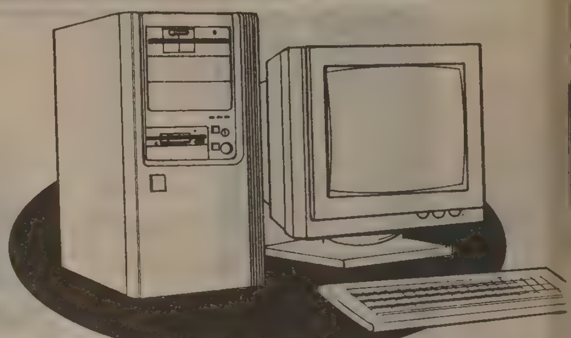


Great innovations from California.

Flexi-time.



Novels to drive by.



Warehouse-priced,
dependable computers.

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California Computer Works.
Once again, California is first.

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Willows Shpg Center
686-2270

San Mateo
Island Shopg Center
578-9200

San Jose
3530 Stevens Crk Blvd.
554-1500

Sacramento
1130 Arden Way
489-1000

SPECIALS THIS MONTH

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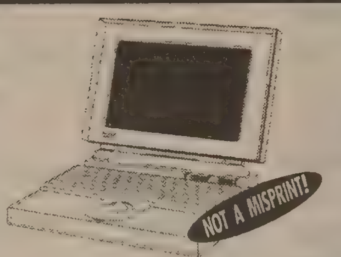
NOT A MISPRINT!

Apple® Macintosh® PowerBook™ 100 2/20

When was the last time you saw ANY new notebook computer at this price? The PowerBook is a fully compatible Macintosh, easy to use and about twice as fast as a Classic®, with a 20 MB hard drive, a centered ergonomic trackball for tight travel seating, and a backlit supertwist display.

$699.

NOT A MISPRINT!

WHILE SUPPLIES LAST!

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LET AITECH SHOW YOU HOW TO PUT YOUR COMPUTER AND YOUR TV ON SPEAKING TERMS.

FREE DEMO IN OUR SAN JOSE STORE SAT., OCT. 17, NOON-4

Pro PCTV (pictured)

A simple, pocket-sized device that lets you watch your notebook (or desktop) computer display on any ordinary TV. A lifesaver for salespeople, educators, demonstrators.

$299.

Aitech
ProPCTV

Pro PCTV Plus:

Does everything the PCTV does, plus it's optimized for Windows, can send flicker-free signals to your VCR for recording, and can display on your computer and TV simultaneously!

$499.

Pro PCTV Video:

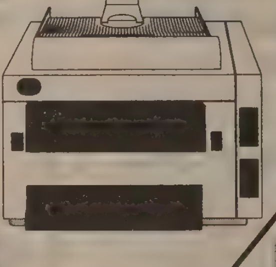
Send as many as 3 video sources to your computer at once and display them on your VGA monitor—including VCRs, camcorders or laser disc players! With screen capture and chromakey capabilities, plus lots of special effects.

$699.

PRINTERS

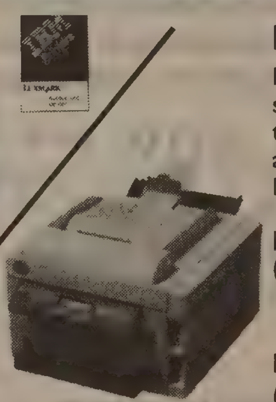
IBM® Laser Printer E

IBM's most affordable laser printer is built to fit on any desktop, prints 5 pages per minute at a sharp 300 dpi, and is built to meet demanding IBM standards.



$829.

® IBM is a registered trademark of international Business Machines Corp. and is used under license. ™ Lexmark is a trademark of Lexmark international, Inc.



IBM® Laser Printers 6 and 10

IBM's Laser 6 and Laser 10 come standard with a 20
sheet input tray, and IBM's Print Quality Enhanceme
they grow with your business with optional envelop
and extra paper drawers and an option for PostScript.®

Laser 6 (6 pages per minute)	**$1485.**
Laser 10 (10 pages per minute)	**$1785**

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WHOLE EARTH

2

CALIFORNIA
COMPUTERWORKS

386SX-25 MHz Desktop

- 1-year depot warranty
- Windows 3.1 • DOS 5.0
- SVGA w/512k video memory
- 200 watt power supply
- 2 MB RAM • McAfee Antivirus
- 3-1/2" & 5-1/4" floppy drives
- 101 keyboard • Power Menu

CCWSCA0014 *Monitor Extra*

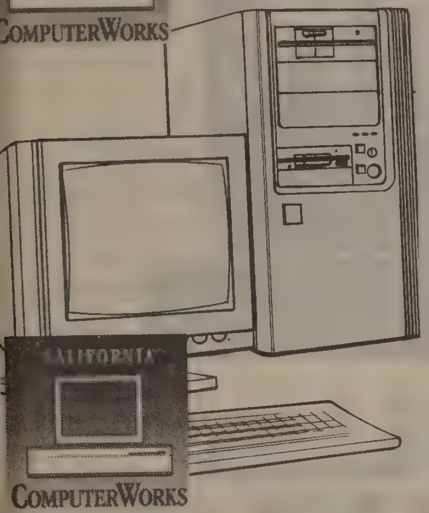
$699. with 40 MB HD

486SX-25 MHz "Baby AT" Desktop Complete System

- 1-year depot warranty
- DOS 5.0 • 1 MB RAM
- 101 keyboard • McAfee Antivirus
- Power Menu • 200 watt power supply
- SVGA w/512k video memory
- 3-1/2" & 5-1/4" floppy drives

#CCWSCA0009

$999. w/VGA Color Monitor & 40 MB HD



1179. w/VGA Color Monitor & 105 MB HD

386DX-40 MHz Mini-tower Complete System

- 1-year depot warranty
- Windows 3.1
- DOS 5.0
- 4 MB RAM
- SVGA w/512k video memory
- 64k RAM cache
- 200 watt power supply
- 101 keyboard
- 3-1/2" & 5-1/4" floppy drives
- Power Menu
- McAfee Antivirus

#CCWSCA0012

1599. w/VGA Color Monitor & 105 MB HD

486DX-33 MHz Mini Tower Complete System

- 1-year depot warranty
- Windows 3.1
- DOS 5.0
- 4 MB RAM
- SVGA w/512k video memory
- 64k RAM cache
- 200 watt power supply
- 101 keyboard
- 3-1/2" & 5-1/4" floppy drives
- Power Menu
- McAfee Antivirus

#CCWSCA0007

1849. w/VGA Color Monitor & 130 MB HD

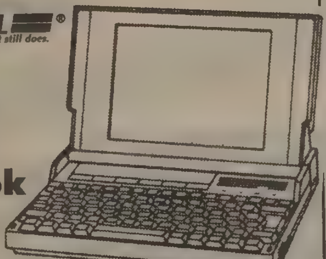
486DX2-50 Mini Tower Complete System

- 1-year depot warranty
- Windows 3.1
- DOS 5.0
- 4 MB RAM
- SVGA w/512k video memory
- 64k RAM cache
- 200 watt power supply
- 101 keyboard
- 3-1/2" & 5-1/4" floppy drives
- Power Menu
- McAfee Antivirus

#CCWSCA0004

NOTEBOOKS

ACKARD BELL®
merica grew up listening to us. It still does.



386SX-25 MHz Notebook

- 1-year limited warranty
- Toll-free 24-hour 300 number for tech support
- Built-in fax/modem included
- 80 MB hard drive
- 2 MB RAM • 3-1/2" floppy drive
- 32-gray VGA screen • DOS 5.0 and DOS Shell • 3-hour rechargeable battery pack

While Supplies Last $1895.

Not affiliated with any former Bell system entity.

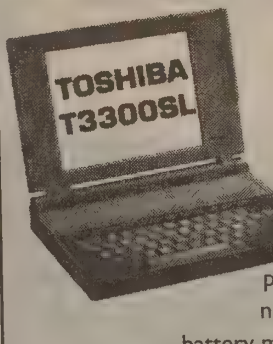
COMPAQ

NEW! Compaq Contura 386SL-25 MHz Notebook

- 1-year onsite warranty
- 60 MB hard drive
- High-contrast VGA display
- 3-1/2 hour rechargeable battery pk.
- Smart hibernation and auto-off
- DOS 5.0 pre-installed
- 2 MB RAM expandable to 10
- QuickLock key protects your data

Limited Supply $1999.

TOSHIBA



T3300SL Notebook

Introducing the T3300SL, Toshiba's powerful i386™SL VGA notebook with advanced battery management capabilities.

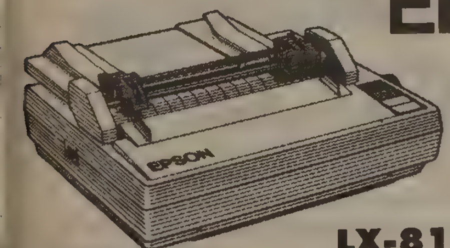
- 25MHz i386SL processor
- 80 MB Hard Drive • 2 MB RAM • VGA display with 32 gray scale capability

Limited Availability.

$2549.

PRINTERS

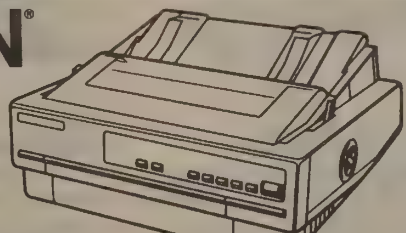
EPSON®



LX-810

9 Pin • SmartPark™ paper handling • 200 CPS Super draft • 30 CPS NLQ • High resolution graphics

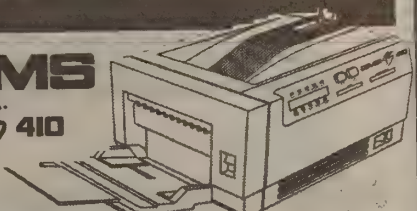
$169.



LQ-570

This 24 pin printer utilizes scalable fonts, enhanced graphics, and advanced paper handling to offer better performance. **$269.**

QMS PS 410



PS 410 Printer

4 page-per-minute PostScript® printer with all the most requested features at an affordable price. True Adobe PostScript, with 45 resident fonts and ATM technology built-in for sharp text, it works with IBM and Apple® Macintosh® computers, 16 MHz 68020 processor.

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San Mateo
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3

Only One Place on Earth

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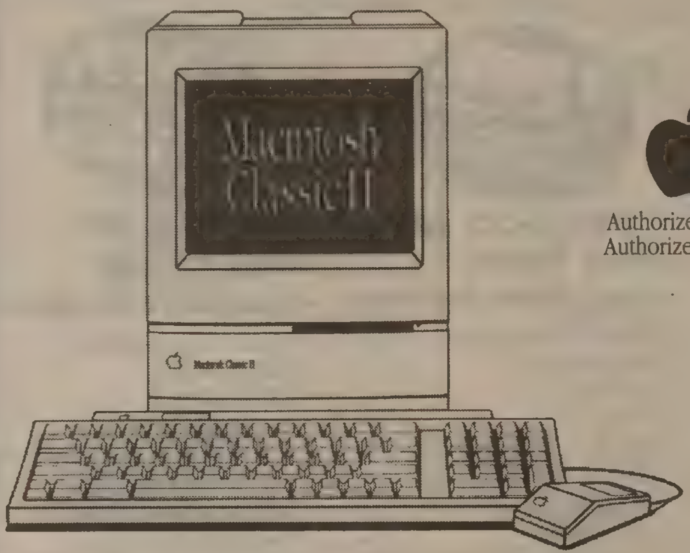


Authorized Dealer
Authorized Service

Apple® Macintosh® Classic® II 4/40

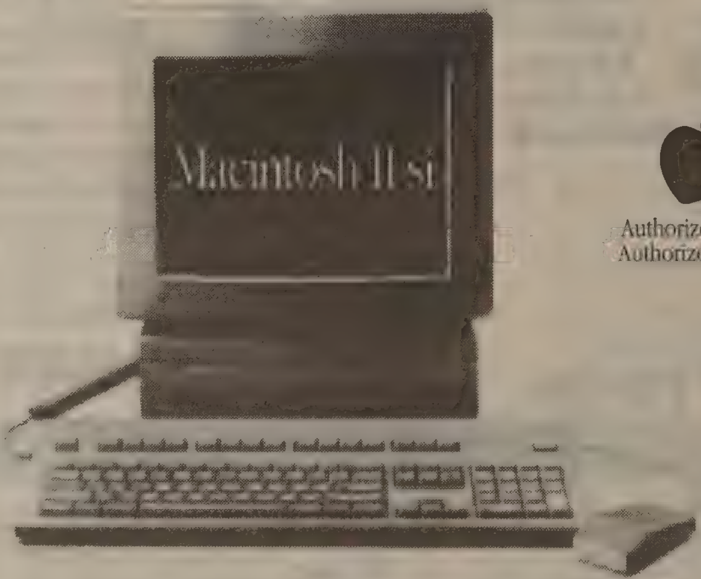
A great combination of solid performance and affordability, the Classic II is the perfect starter computer for students and small businesses. It runs System 7 nicely and sports the famous easy Macintosh interface and all-in-one design.

$995.

Apple® Macintosh® LC II 4/40

For presentations, education, kids, the sciences, and the arts, you need color! And there's no easier color computer to use than the affordable LC II, with its slender modular design and ability to run all your favorite software. *Monitor extra.*

$1099.



Authorized Dealer
Authorized Service

Apple® Macintosh® IIsi 5/80

The Macintosh IIsi boasts an expandable combination of color and sound capabilities, with a small footprint that makes it a great fit in any home or business. The kids will love this one for games; you'll appreciate its speed and expandability. 5MB RAM/80 MB HD. **$1749.**

Keyboard/Monitor Extra

Apple® Macintosh® IIci

The IIci gives you power with room to grow, including built-in flexible video support and an optional cache card for increased performance. Businesses will love its number-crunching speed; creative types will appreciate the way it juggles color graphics. 5 MB RAM. *Monitor and keyboard extra.*

$2099.

The Only Place on Earth to Buy Computers

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Prices subject to change without notice.

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WHOLE EARTH

Gives You This Wide A Selection.

4

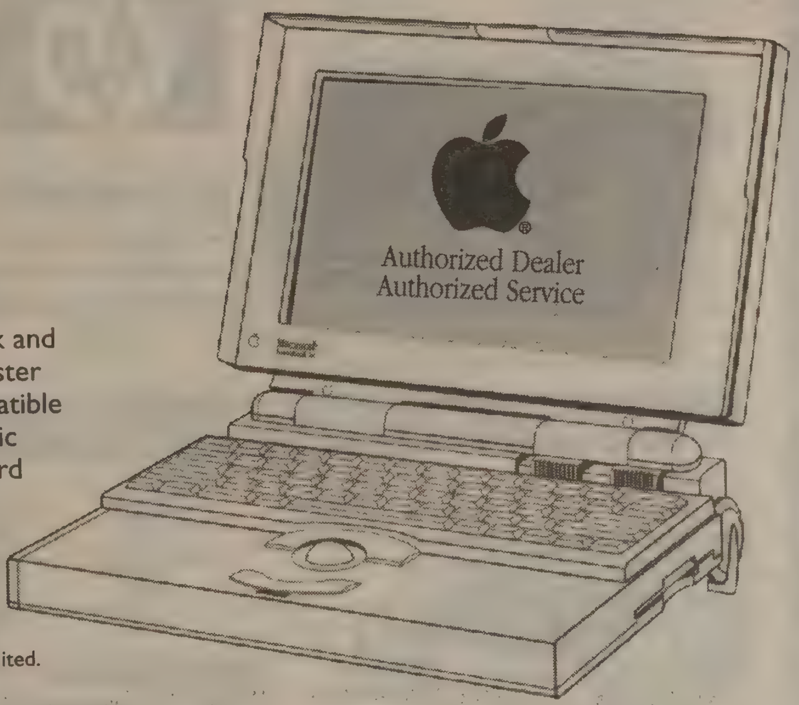
Authorized Dealer
Authorized Service

NEW!

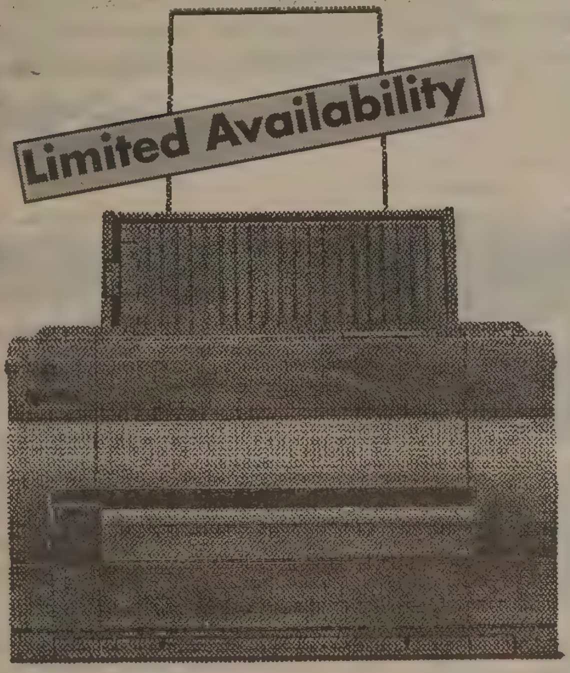
Apple® Macintosh® Powerbook™ 145 4/40

Apple took the ease and convenience of the PowerBook and added a new processor that makes the 145 over 50% faster than the PowerBook 140. It's still fully Macintosh-compatible and connectable, with the famous PowerBook ergonomic trackball, 4 MB RAM (expandable to 8), and a 40 MB hard drive.

$ 1999.



The PowerBook 145 is a new product in high demand and supplies are limited.



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Authorized Service

Apple® StyleWriter®

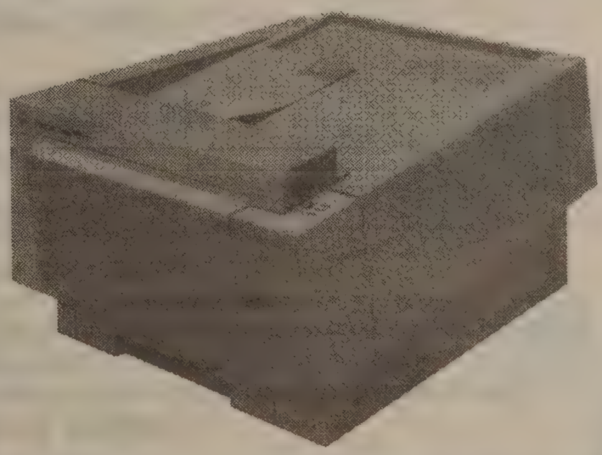
The Stylewriter gives you outstanding laser-like quality results for only a fraction of the cost of a laser printer. It's now 3 times faster than before, and comes with 39 fonts. Compatible with all Macintosh® computers.

$325.

Apple® Personal LaserWriter® NTR

Whether you use Apple Macintosh® computers, Windows PCs, or both in combination, the NTR will pump your text out fast and make your art look gorgeous with a modern RISC controller and advanced page-description language.

$1679.



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10am-8pm

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Sat-Wed: 10am-6pm Thurs & Fri
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Sun 11am-6pm

San Jose
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Sat & Sun: 10am-6pm

Sacramento
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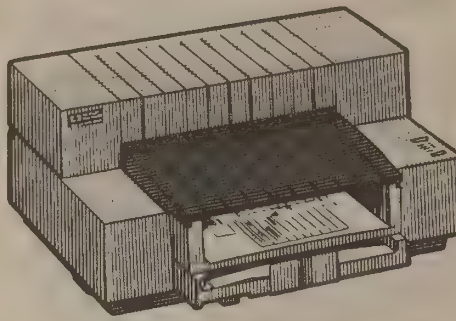
5

Only One Place On Earth Keeps

THE ONLY PLACE ON Earth TO BUY COMPUTERS

HEWLETT PACKARD

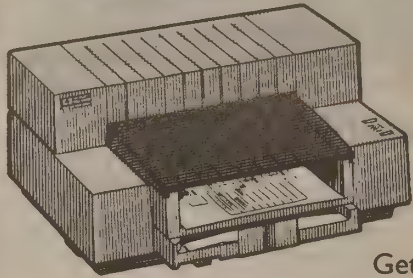


HP DeskWriter Printer

Get laser-like 300 dpi quality from your Apple® Macintosh® or AppleTalk® network, at a price lower than many dot-matrix printers. There's a good reason why these sell as fast as they come in.

$399.

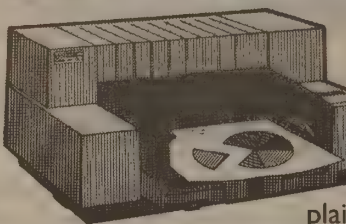
IF YOU'RE NOT SATISFIED FOR ANY REASON, PLEASE LET US KNOW.



HP DeskJet 500 Printer

Get laser-sharp printing from all your DOS and Windows applications at a dot-matrix price. This instant classic inkjet printer from HP works with TrueType or font-scaling software to give you perfect type at any size.

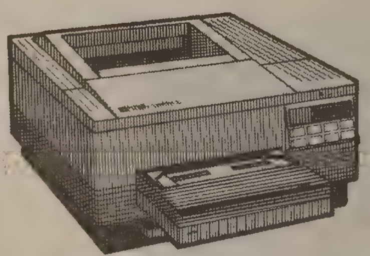
$399.



HP DeskJet 500C Printer

Get 300 dpi laser-quality color printing on plain paper and transparencies, for persuasive design and presentation power at a fraction of the cost of a color laser printer. Supports all major software including Windows; 3-year limited warranty.

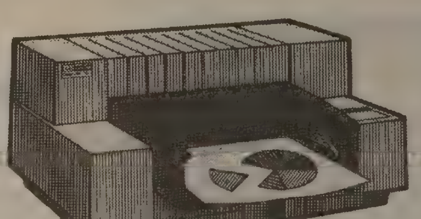
$629.



HP LaserJet III Printer

The industry standard in laser printers, the 8-page-per-minute LaserJet III offers snappy, dependable 300 dpi performance and reliable paper handling. Keeps up with the heaviest print loads.

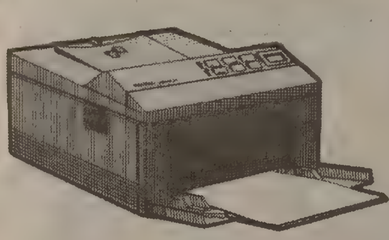
Limited quantity.



HP DeskWriter C Printer

The new HP DeskWriter C adds color capacity to the DeskWriter's already-famous laser-quality black output. It's compatible with popular Macintosh® software and your budget.

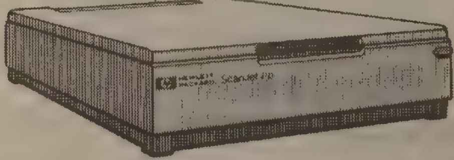
$629.



HP LaserJet IIIP Printer

Whole Earth makes the super-advanced but hard-to-get LaserJet IIIP available again. It's compact but powerful, with faster print speed than other printers in its price range, plus built-in type scaling and upgradeability to PostScript for PC and Macintosh.

Limited quantity.



HP ScanJet IIP Scanner

Scan images at 300 dpi resolution, or scan text using OCR software and stop typing it in. Exceptionally easy to use; works with most popular scanner software packages.

Limited Availability

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459-3533

San Francisco
401 Bayshore Blvd
285-5244

Concord
Willows Shpg Center
686-2270

San Mateo
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578-9200

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WHOLE EARTH

6

You Coming Back for Deals.

Manufacturing Company, Inc
CURTIS

iversal Printer Legs
5 95

System Connection

Power Control Center
SP1000
$15 95

BASIC NEEDS

Utility Pack
$7 95

MicroComputer Accessories, Inc.
A RUBBERMAID COMPANY

Tilt & turn
monitor stand
$13 95

THE SOFTWARE TOOLWORKS

NOW FOR MACINTOSH®

Software Toolworks

The Miracle Piano Teaching System

The first keyboard that teaches you how to play! • Pro keyboard with 49 large velocity-sensitive keys, 128 instruments and sounds • Full orchestral accompaniment • Flashcards, demo, video games, practice sessions, all designed to help you learn how to play piano.

MAC .... $429.

DOS .... $399.

INLAND

Surge Protector
$4 95

INLAND

3.5" BOX
HOLDS 80 DISKS!
$4 95

System Connection

similar to illustration

Mouse w/software
AC-ME01
$9 95

ALLSOP
Dual Disk Drive
Cleaner CK.-50
$5 95

B Innovators
Vrist Rest

rotect yourself!
must-have for
yone with
keybaord.

$4 95

MicroComputer Accessories, Inc.
A RUBBERMAID COMPANY

Space-Efficient Workstation

A mobile, compact and self-contained computer desk for the home or office • Glide-out keyboard drawer with built-in wrist rest/storage compartmenty #1050 **$109.**

TDK HD
"Super Electron Beam" Floppy Disks

79¢ per disk

(SOLD IN 20-PACKS ONLY)

FREE with each 20-pack!

Sit-Back® for DOS Hassle-free backup software
$100 value

SOFTWARE

rince of Persia from Broderbund

nimated game of the year, with Arabian Nights theme
nd endlessly challenging levels. **25.**

fter Dark

Vacky animations or gorgeous changing patterns to fight
creen burn-in and enhance your office. A must-have! **25.**

aboom

cores of humorous digitized sounds to replace your
lac's regular beeps and event sounds. **25.**

armen San Diego (all editions)

ll-time bestsellers with great sounds and graphics. Kids
earn geography, history, and more as they track down
he world's most insidious crook and her gang.

xcluding CD ROM version **35.**

AM Anti-virus

rotect your computer from unwanted software guests.
rom Symantec, the leader in virus insurance. **59.**

My Advanced Label Designer

With My Advanced Label Designer, you can pump out every kind of Avery label, audio and video cassette labels, even signs and flyers. Super-easy to learn.g.

Macintosh 35. Windows 35.

Microsoft Word

The best-selling word processor for the Macintosh and Windows is easier with drag-and-drop editing and built-in grammar checking.

Macintosh 289. Windows 299.

Microsoft Excel

Bill Gates ordered the Microsoft team to create the best spreadsheet ever. Now Whole Earth offers it at the best price ever.

Macintosh 299. Windows 329.

Lotus 1-2-3

It's easy to use, widely compatible, and full of flashy new features. Whole Earth makes it easy for you to bring your office into the 90s.

DOS 319. Windows 329.

ELECTRONICS

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THE BEST PRICE IN TOWN!

$795

486-50 MHz w/64K Cache

Intel 80486 50 MHz CPU

- 1 MB Expandable to 32 MB on board
- 8K Internal Cache
- 64K External Cache exp. to 256K
- Shadow RAM
- 1.2 or 1.44 MB Floppy Drive
- 1:1 Internal HD/FD Controller
- Tower or Desktop case w/power supply
- 101 Enhanced Keyboard

486-50MHz EISA 128K Cache. $975

w/Orchid Local Bus Motherboard $1050

$635

486-33 MHz w/64K Cache

- 1 MB Expandable to 32 MB on board
- 8K Internal Cache
- 64K External Cache exp. to 256K
- Landmark=152
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- Tower or desktop case w/power supply
- 101 Enhanced Keyboard

486-33MHz EISA 64K Cache $815

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386-SX 25 MHz

- Landmark=36
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- 1.2 or 1.44 MB Floppy Drive
- Tower or desktop case w/power supply
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386-SX 16 MHz

- Landmark=21
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- 1.2 or 1.44 MB Floppy Drive
- Tower or Desktop case w/power supply
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286-12 MHz 0 Wait

- 6/12 MHz 0 Wait
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- C & T Chip Set
- EMS 4.0 Built-In
- Shadow RAM
- Landmark=16
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- Socket for 80387
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- Landmark=57
- Shadow Ram
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- 1:1 Interleave HD/FD Controller
- Socket for 80387
- Tower or desktop case w/power supply
- 101 Enhanced Keyboard

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386-25 MHz

- Landmark=36.7
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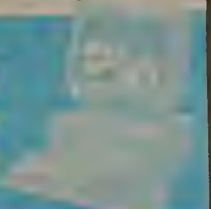

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Ultraster ESDI 22F (EISA)	435

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486-50 MHz w/64K Cache	675

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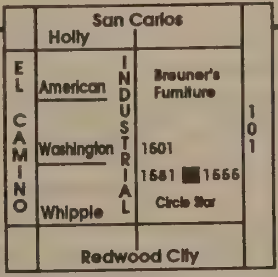

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- IDE Controller Card
- I/O (2S/1P/1G) Card
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3C87-40	.89
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500718-001 1 MB Module	.75
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500510-007 1 MB Kit	.95
500510-008 4 MB Kit	.225
Premium 386	
500510-003 1 MB Kit (static)	.75
500510-004 4 MB Kit (static)	.185
Cupid Exp Brd for Premium 386/25; 386/33; 486's	
500722-004 1-16 MB Exp Brd	.425
Premium Exec Notebook 386SX20	
1 MB Module	.99
4 MB Module	.210

ZENITH DATA SYSTEMS MEMORY

Item	Price
Mdl Z-386SX	
Z-605-1 2 MB Kit	$125
Mdls Z-386/33E; 33; 25; 20	
ZA-3800-ME 1 MB Module	.90
ZA-3800-MK 4 MB Module	.205
SuperSport SX	
ZA-180-64 2 MB Card	.199
ZA-180-86 2 MB Card (ALPHA)	.199
ZA-180-87 2 MB Card (BETA)	.199
SuperSport 286; 286E	
ZA-180-66 1 MB Card	.185
SuperSport 286E	
ZA-180-64 2 MB Card	.199
Turbosport 386E	
ZA-3034-ME 1 MB Card	.199
4 MB Memory Card	.495

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Chip	Speed	Price
68020	16 MHz	$129
	20 MHz	.169
	25 MHz	.179
	33 MHz	.199
68030	16 MHz	.129
	25 MHz	.199
68010	16 MHz	.60

QUME LASER MEMORY

Item	Price
QS 410	
1 MB	$150
2 MB	.199
3 MB	.210
4 MB	.225

COMPAQ MEMORY

Item	Price
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113131-001 1MB Module	$99
113132-001 4MB Module	.199
DeskPro 386/20e; 25e	
113644-001 1-9MB Exp Brd	.150
113645-001 4-12MB Exp Brd	.275
DeskPro 386s-16	
113646-001 1MB Module	.99
112534-001 4MB Module	.199
113633-001 1-9MB Exp Brd	.160
113634-001 4-12MB Exp Brd	.260
DeskPro 286N; 386N; 386SX/20	
118688-001 2MB Module	.85
118690-001 4MB Module	.180
DeskPro 386N; 386SX/20	
118689-001 2MB Module	.120
DeskPro 286N; 386N	
118700-001 0-4MB Exp Brd	.175
DeskPro 386/33L; 486/25; 486/33L; SystemPro	
115144-001 2MB Module	.150
116561-001 8MB Module	.350
116568-001 32MB Module	.2100
DeskPro 386/16	
108071-001 1MB Kit	.99
108069-001 1MB Exp Brd	.230
108069-002 2MB Exp Brd	.325
108070-001 4MB Exp Brd	.460
108070-002 8MB Exp Brd	.745
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107651-001 1MB Kit	.199
107653-001 4MB Exp Brd	.325
107654-001 4MB Exp Brd	.325
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117081-001 1MB Module	.99
117081-002 2MB Module	.150
117081-003 4MB Module	.450
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110235-001 1MB Module	.175
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118305-001 4MB Module	.325
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107331-001 512K Kit	.55
107332-001 2MB Kit	.145

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D1642A 4 MB Kit	.185
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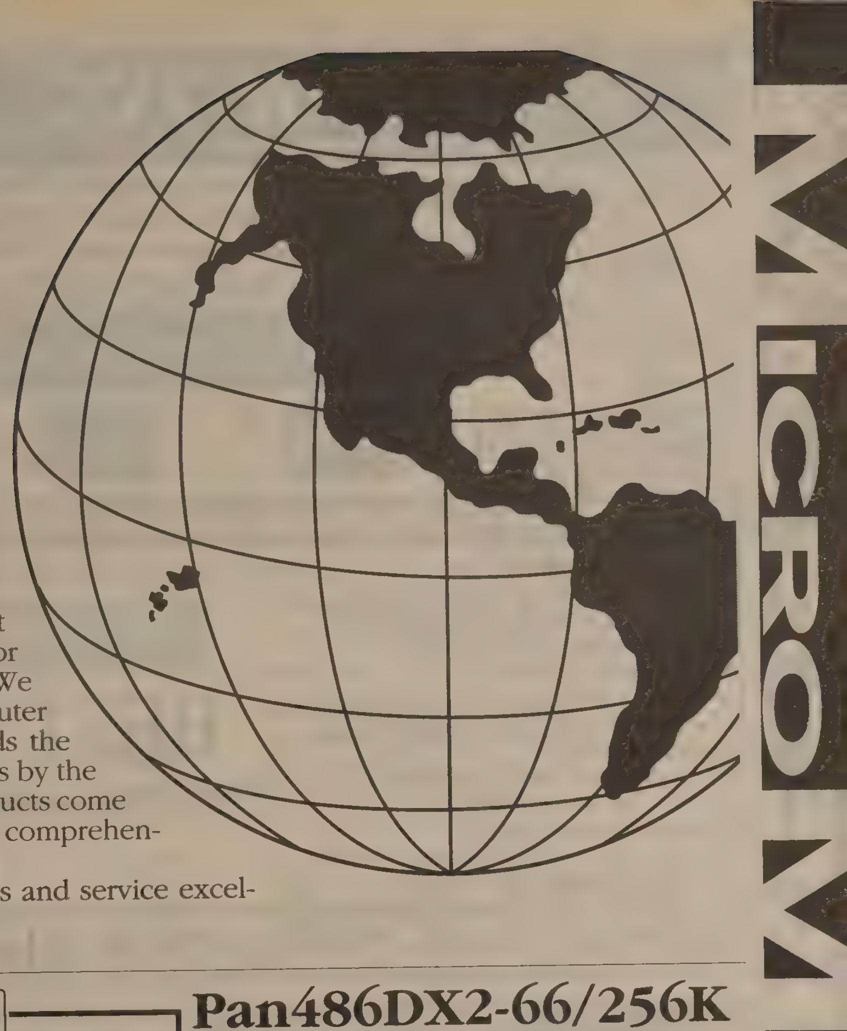

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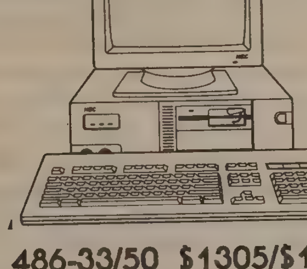

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386SX-33	120
386SX-25	120

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256KX9-70	$11
1MX9-70	32
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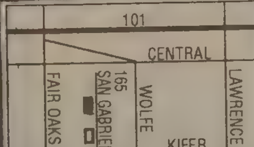

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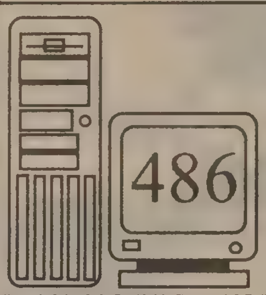

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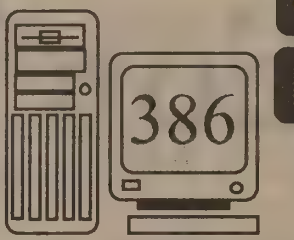

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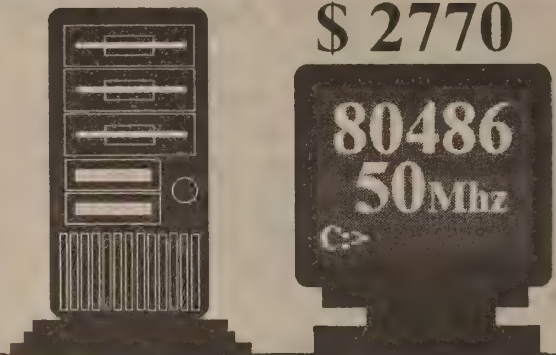

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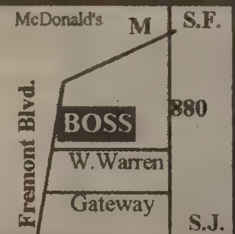

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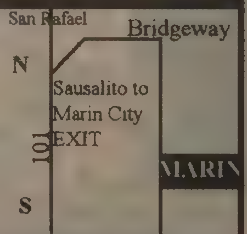

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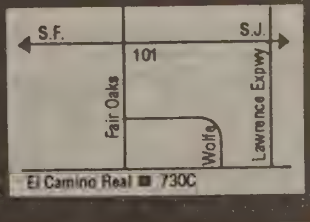

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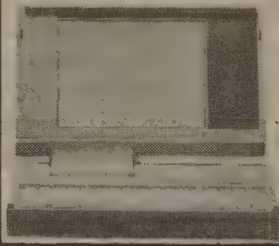

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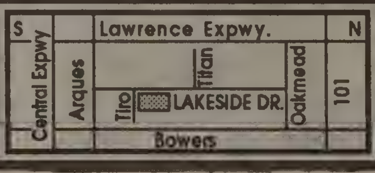

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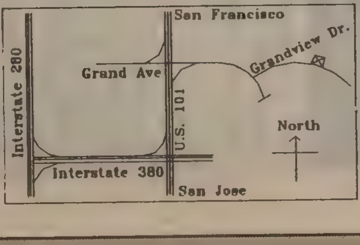

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ASA 486-33/DX-50 256k	$620/795
ASA 486-33/50 256 EISA.	$815/975
..(upto 128MB; 1MB Cache)	
MYLEX	
386DX-33 w/ I/O, IDE 64K	$375
486DX-33 w/ IDE, I/O 128K	$785
486DX-33 EISA 128K	$1295
TYAN48650DX/2 EISA,256K	$1290/1175
..(upto 256MB RAM, 512K Cache)	
Genoa 486-33 w/64K .upto 64M.	$650

CASES/PS

XT Turbo w/ PS	$55
Baby Desk/Tower w/ PS	$54
Baby Desk PS Del	$69
Medium Tower/Full AT w/ P.	$79/69
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PS2 300 W	$95
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UPS's see in Networking Products	

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IDE Caching UltraStor	$209
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DTC	$103
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ADAP 1740 EISA	$469
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MYLEX EISA Caching	$565
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DPT Smart Cache+EISA	$540
DPT +Caching Module	$385
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DTC	$119
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Ultra 22F Caching EISA	$449
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XT HDC	$45

ADAPTERS

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Color Card	$23
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Tseng 1MB	$79
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Orchid IIs w/ 32K Color	$169
Orchid Fahrenheit.w/sys	$210
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P17CS01 17",FST,1280,.26	$1205
P21CR00 21",FST,1280	$1839
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MF5217 17",60/70Hz	$899
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MF5421A 21",LMF,1600,.26	$2329
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5FG 17",.26,Microp	$1375
6FG 21",.26,Microp	$2835
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L23 ACAD,T34020,1280,16C	$1215
L24 Win,T34020,1280,256C	$1286
L25 ACAD,T34020,1280,256C	$1430
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GOLD 16+2, Ti34010	$425
GOLD 24, Ti34010, 24 Bit	$365
GOLD 24+2, Ti34010, 24 Bit	$495
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X/Series 16,1280,72Hz,DPC	$1497
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Cobra Sp,1024,72Hz,Rend Rdy	$1077
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GXE020B Ti34020	$1045
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ARTISOFT	
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LOGITECH	
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14,400 Spr Md/Fax Int/Ext	320/337
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KXP4450i 11ppm,300, 28f	$1099
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Okidata	
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OL800, 8ppm, 300dpi	$899
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OL830, w/ 2MB post script	$1278
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Lasermaster 1000 dpi 10ppm	$4995
Citizen	
200GX 9 pin	$159
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HP II, IID..1/2/4MB	$78/112/179
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Pan 4450..1MB	$149
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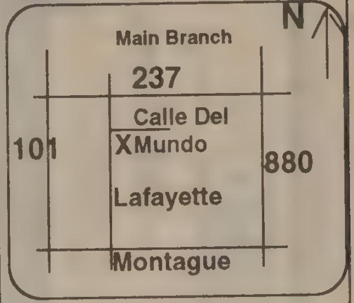

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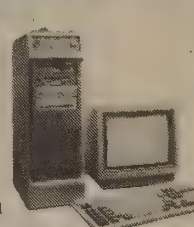

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- *8MB DRAM 70ns (up to 64MB)
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  40% Performance Boost Up
  Support Up to 1024x768 & 72Hz
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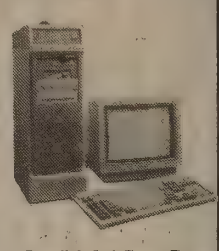
(Monitor not included)

486-25SX/33/50/66 MHz 64KB Cache 120MB HD ISA



- *Intel 486-25SX/33DX/50DX2/50DX/66DX2 MHz
- *64KB WriteBack Cache
  (up to 256 KB)
- *4MB DRAM 70ns (up to 32MB)
- *120MB 15ms IDE Hard Drive
- *SAMSUNG SyncMaster 3 1024x768
  0.28dp SVGA monitor
- *Trident 8900C 1024x768 w/1MB
  SVGA Graphic Card
- *TEAC 1.2MB Floppy Drive
- *TEAC 1.44MB Floppy Drive
- *101 Enhanced Keyboard
- *Microsoft Compatible Mouse w/ Pad
- *2HD/2FD IDE Controller w/ 2 Serials, 1 Parallel, & 1 Game Ports
- *Tower Case w/230 Watts Power Supply
- *Microsoft DOS 5.0 Package

$ 1299/1549/1659/1749/2299

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- Intel 486-33DX/50DX2/50DX/66DX2 MHz
- 256KB WriteBack Cache
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- 2 Serials, 1 Parallel, & 1 Game Ports
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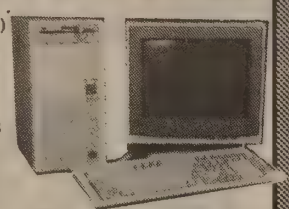

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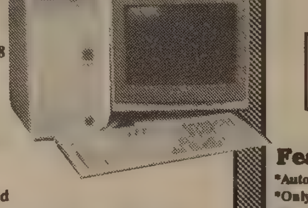

- *386DX-33/386DX-40
- *64KB WriteBack Cache
  (up to 256KB)
- *4MB DRAM 70ns (up to 32MB)
- *105MB 15ms IDE Hard Drive
- *SAMSUNG SyncMaster 3 1024x768
  0.28dp SVGA Monitor
- *Trident 8900C 1024x768 w/1MB
  SVGA Graphic Card
- *TEAC 1.2MB Floppy Drive
- *TEAC 1.44MB Floppy Drive
- *101 Enhanced Keyboard
- *Microsoft Compatible Mouse w/ Pad
- *2HD/2FD IDE Controller w/ 2 Serials, 1 Parallel, & 1 Game
- *Mini Tower Case w/ 230 Watts Power Supply
- *Microsoft DOS 5.0 Package

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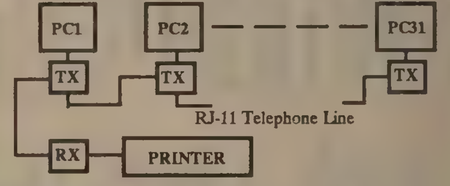

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- *4096 files print queue
- *255 copies for each printing file
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* w/system

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Paradise Graphic Accelerator w/1MB&Hi-C	$189
Tseng Lab 1024x768 w/1MB	$99
Orchid Pro-Designer IIs w/1MB & Hi-Color	$139*
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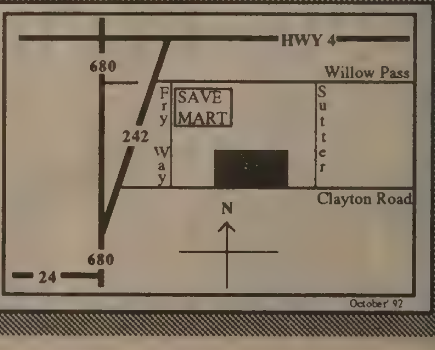

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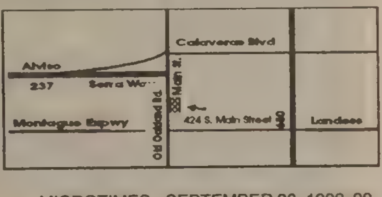

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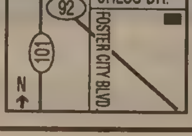

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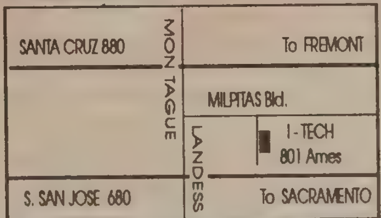

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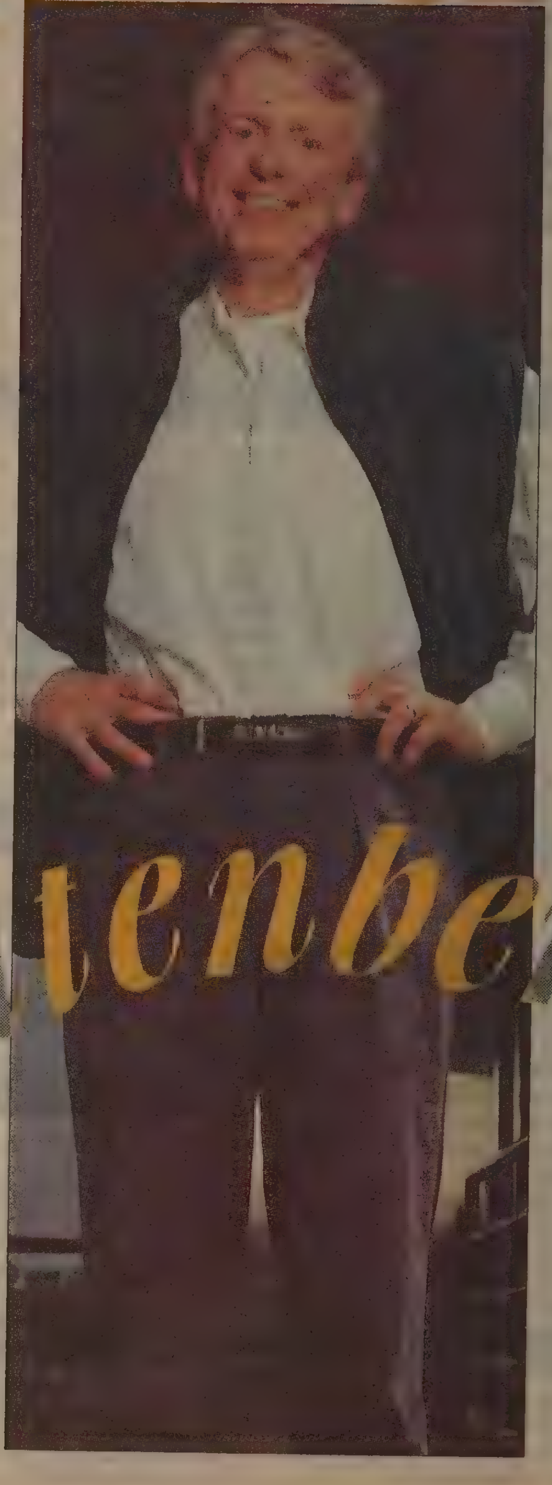
Jonathan Seybold

An Interview By John Perry Barlow

Photos: Ann Summa



From Gutenbe

To Cyberspace

Time was, I didn't pay much attention to Jonathan Seybold. As far as I could tell, he was another of that proliferating mob of digital gurus who thrive on the computer industry's passion for conferences and trade shows. (It's a wonder to me anything ever gets done in this business given that its leaders spend most of their time hanging out with one another in plush earth-tony hotels.)

Seybold's "schtick," as he himself puts it, seemed to be desktop publishing, which I figured was a good and growing niche to guru-ize. (I foresee a day when everyone in the Informatized World will publish his/her own newsletter.) Seybold's conferences were obviously riding that wave, and I guess I thought he'd only put his board in the water at the point when Steve Jobs gave scalable fonts to The Rest of Us. I didn't figure him to be on to much more than the latest in scanning hardware and group rate discounts.

Boy, was I wrong about that. And I knew I was wrong the first time I ever actually saw him in action, grilling Jobs, Bill Gates, and John Warnock at the Spring 1990 Seybold conference in San Jose. I could see with one eye that not only was he every bit as smart as those three well-known-to-be-smart guys, he had something they didn't: a genuinely deep sense of what this stuff called information really *is*.

He also seemed to have a very broad view of the larger ecology in which information industries operate, the result, I later learned, of a veteran's experience with information technology which goes back to the Linotype machine.

Finally, he appeared to have a sense of mission about information which, while it served his personal interests well enough, was not driven by them. I got the impression that he would do what he does—rubbing people, companies, and ideas together—for the sheer joy of watching them spark and connect, even if he weren't also getting rich in the process. (As you will learn in the following, it was Seybold who connected Paul Brainerd with Apple and thus created desktop publishing.)

Getting to know Jonathan Seybold has confirmed these perceptions, at least to my satisfaction. He is one of very few people I've encountered who really seem to understand the enormity of what is being undertaken here—who have a clear sense of what economic, technological, political, social, and cultural elements must combine to create the weird world our children will inhabit.

In addition to his better known conferences—which have become the COMDEX of DTP—he has also started convening a smaller and much more ecumenical gathering each year called Digital World, attended by leaders from a variety of information-oriented industries, such as entertainment, telecommunications, publishing, and broadcasting, as well as the computer business.

This year's Digital World, held in Beverly Hills in late June, was an interesting and somewhat troubling experience. The attendees seemed to have come down with a terrifyingly partial version of Seybold's sense that Big Things were about to happen as their industries converged. Their overall reaction put me in mind of Bob Dylan's taunt, "Something is happening and you don't know what it is, *do you*, Mr. Jones."

Maybe Mr. Seybold does. At the very least he is prepared to press on through the fog with the same enthusiasm which has propelled him for thirty years.

It was shortly after Digital World that I sat down with him in his new Malibu office. Coastal light angled in through the vaulted windows and the scent of sea air was strong enough to make it into the air conditioning. I had a lot of fun doing the interview that follows.

How did your family get into all this digitalia?

Well, it actually goes back to '59 or '60. I was an exchange student in Holland, and my father decided that he really wanted the experience of living outside the US as well. He took a leave of absence from his job, took a job running a program for the American Friends Service Committee in Paris, and went to live in Paris for a couple of years.

Where were you from originally?

From Pennsylvania.

By the way, it's totally not relevant, but it was a very interesting program, because it was setting up international seminars drawing together future leader types from different countries, mostly at the graduate student level. There were Third World people, people from Communist countries, Western countries, all together to talk about problems in common. It was a lot of fun.

Before running this program, my father had been involved with the publishing industry as a labor arbitrator and labor mediator. He'd written a couple of books about the industry, and he was the head of the industry association for the Pennsylvania and New Jersey area.

He came back from being away, looked around, and it was very obvious to him that there was a dawn about to break in publishing which involved computers. He tried to get people in the industry excited about the revolution that was going to come, and nobody was interested.

At that point, they were using photo-offset and...?

At that point, most of it was still hot metal. Phototypesetting was just beginning, and his idea was that a phototypesetting machine was a natural computer output device.

There were a few experiments going on at that time at a couple of newspapers in the US, but that was all that was being done.

Now I was sort of tracking this through the last bit of college, and encouraged him to found the company. I did not join it immediately, but instead went to graduate school.

Where were you going to school?

I went to college at Oberlin College in Ohio, and I went to graduate school at Yale in economics. But the lure of digital technology pulled me away from graduate school, because it was much more interesting than teaching economics to somebody someplace.

It was very clear to me that the digital technology was going to get better and better and better. If you looked at the curves, there was no reason it wouldn't keep getting better indefinitely.

At that time, it was just data processing... accounting and inventories and things of that sort, which weren't terribly interesting. But what really intrigued me was that we could apply this technology to the process of communicating information. This interested me from both the social standpoint and economic standpoint. From an economic standpoint, it was clear that information, knowledge, and education were going to be the key economic resources of the coming decade. From a social standpoint, the foundation of a democratic society is the exchange of information. At that time, communicating meant going through unionized craft people using specialist craft tools. It was expensive, it was time-consuming. There was a lot of back-and-forth in it. And the economics were gradually concentrating ownership and forcing mass-market dissemination of information at the expense of diversity.

The time frame is '63, '64..?

Right, exactly, and '65/'66.

So it seemed to me that technology was the best antidote for it. What we've been about since that time, is essentially empowering the people who want to communicate.

> *“It was very clear to me that the digital technology was going to get better and better and better. If you looked at the curves. there was no reason it wouldn't keep getting better indefinitely.”*

Initially we started with text, because that was the easiest thing to put in digital form. But the vision was never limited to that, even in the beginning. As the technology improved, you would be able to communicate with drawings, with images, and ultimately, it was clear, those images would have sound and motion.

This must have been a lonely perception at that point.

Well, yeah. And it was why it was hard to raise money. *[laughs]*

There's an interesting sidelight here. Our company was acquired in 1967 by a printing company, and about a year after that the president of the printing company came under a great deal of pressure from some of his stockholders, who wanted to know what he was doing with these crazy people in his employ who thought that hot metal was dying.

Yes, there was always tremendous resistance to these things.

You were basically an information think tank at that point?

No. We had to make a living doing this. So we were developing our own software, developing our own systems, and providing services initially to major publishers in the US.

And these systems would have been like ATEX systems?

Well, we're starting now from scratch, okay? We ended up choosing an RCA 301 computer, because it had cheap mag-tape drives on it. This was before disks. You needed storage. Now this was a 20K, 6-bit memory machine. *[laughs]*

When people came along twenty years later and told me you couldn't do this stuff on PCs, which were enormous computers compared to what I'd lived with, I had some perspective.

We had to write our own operating system, because the one that RCA had was crap. We had to write our own sort programs, we had to write our own assemblers. There were many nights when we were trying to run long runs on the computer, when at three o'clock in the morning I was sitting there in front of the computer, entering binary program patches into memory.

So you had to teach yourself how to program?

Yeah. I never spent much time writing code but I had programmers reporting to me, so we had to learn everything. So we were literally inventing the future as we went along.

Are any of those concepts in common use today?

It's actually interesting how little things have changed in what's now almost thirty years. Maybe that's because we got the concept right early on. Maybe it's because we've influenced a lot of people. But if you look at the stuff we were doing at that time, it looks remarkably similar to what people do now.

For example, from the very beginning we had simple codes which marked text by structure—heads, subheads, body copy, which you then defined separately to be styles. You also used those same tags for information retrieval, because we were doing a lot of sorting and manipulation. You know, once you have that computer you can do all kinds of things with it.

So the tag that said "This is a title of a book" gave you a handle on it that said "You can pick this out for retrieval purposes, but also you can define separately how you want it to appear typographically."

Most of the stuff that we were working on—for example, the way hyphenation-justification routines work and so forth—that's all the same now. There's nothing terribly new from that standpoint.

Of course, the technology has improved tremendously since that time.

Also, the '60s were the time when Ted Nelson was starting to think about hypertext—I got into arguments with Ted in '68 about hypertext links and writing hypertext documents and so forth. Now the technology was clearly not ready to do hypertext kinds of things at that time, so although the typesetting and publishing techniques progressed through the '60s, '70s, and '80s, the hypertext portion of this stuff sort of disappeared for a decade and a half before it suddenly reemerged again when the technology was nearly ready.

But even then you were thinking about the eventual elimination of the paper "bottle?"

Yeah. A lot of the stuff that we were doing was information databases. Which you would present to people in whatever form was convenient. We began working with video terminals in '67, because video terminals gave you a window into the computer that you didn't have any other way. We began working with images about the same time.

Did you ever think of yourself as becoming a videotext company and going that route?

It was hard enough to keep ourselves alive doing the kinds of things we *were* doing. Basically, we were trying to convince print publishers that they were in the information business, and they should think in terms of an information product. And that they should get it into the computer so they could do different versions of it in print. Then, as the technology improved, that asset—information in electronic form—could be distributed in a variety of ways.

But they still thought their product was the bottle and not its contents?

Our job was to convince them that it was the contents. That was our key job. Because once they started thinking that way, then what we were doing became logical.

A lot of them aren't thinking that way yet.

No. But some of them were at that time, and those were the people that we ended up working with. There were people throughout the industry who were thinking in interesting terms at that time—there was a vice president of production at McGraw-Hill who was trying to reform the way that books were produced, for example. He documented the way in which a novel or a textbook was produced through the publishing process, and it was ludicrous, just insane, that it would take so long, and require so many hands and so many people, to get this thing from the author's mind to the printed page.

I'm afraid that hasn't changed either.

It hasn't.

You can't imagine what I've gone through trying to get Viking Penguin to buy my editor a cheap computer—there's a huge cultural problem there.

Yeah. Well, it seems at times that these things happen very rapidly, but if you look at it in terms of the perspective of how long we've been at it, the changes have actually not been so rapid. We're still dealing with the problems of the 1960s.

But the other important sense I had was that the ultimate goal is to empower the person who wants to communicate, that the objective over time would be to put more and more of the craft skills into the electronic box. So that you would be able to lower those barriers and provide an efficient direct link between the author, if you're thinking in print terms, and the reader.

Yeah, the point is getting what's in my head into yours, and vice versa. I want to find as fluid and faithful a method of transmission as possible. I don't care what it looks like. Telepathy would be best, but failing that...

Right. And ultimately you want to make use of all the tools possible to communicate. If words are the

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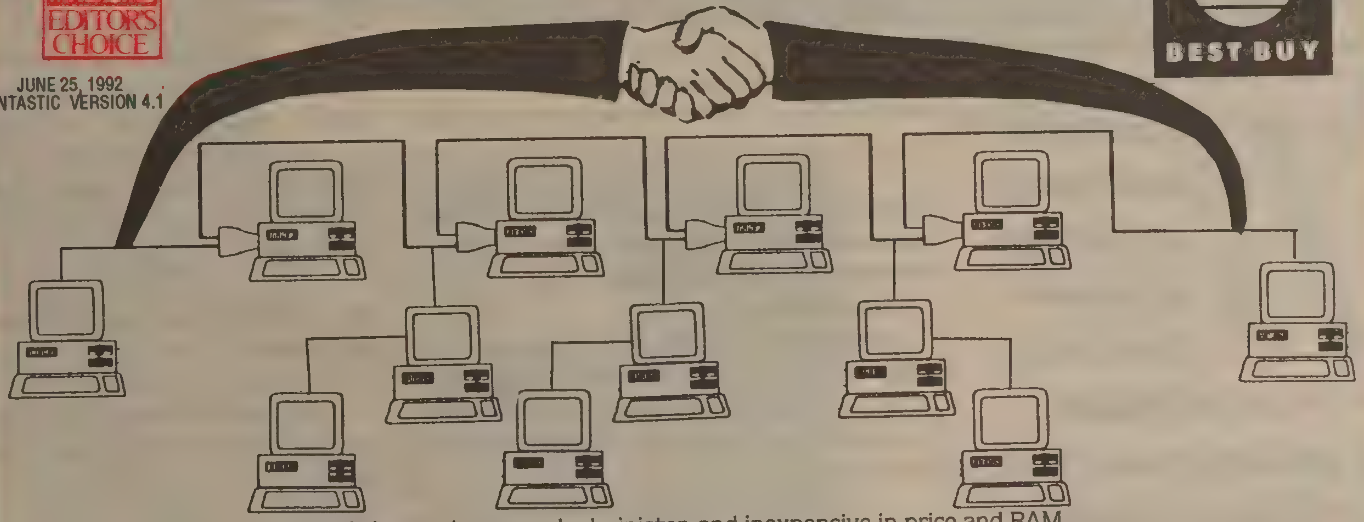

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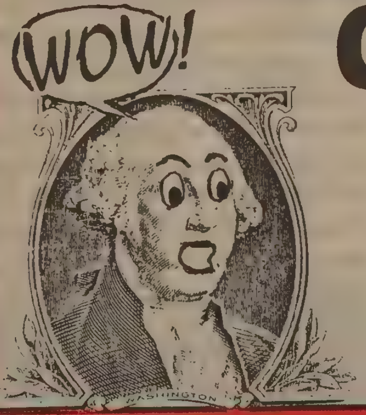

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best way, you use words. If images are the best way, use images. If it's sound, use sound. Whatever media are most effective, you should be able to use those media to communicate, and you should be able to, as an artist, to create in those media.

To get back to the story...we had a major conversion to do in the late '60s, because RCA was clearly not the way to go as far as computer systems were concerned, so we had to rewrite all the software to run on IBM computers instead. In that process, we decided that we'd rethink the way you develop software, and we ended up with a fairly primitive implementation of object-oriented programming. We wrote all of our stuff as modules, and we wrote them in IBM macro assembler, and then linked these objects together, because that was the rational way to build reasonably complex software systems. We had enough experience by then to realize that software is never finished, you're always adding things to it. But it was clear this was the way to do things.

Thus, I ended up having to run a development operation and deal with computer science kinds of issues as a means to the end of advancing the state of the art and serving our customers.

"Basically, we were trying to convince print publishers that they were in the information business, and they should think of it as an information product. And that they should get it into the computer so they could do different versions of it in print. Then, as the technology improved, that asset—information in electronic form—could be distributed in a variety of ways."

We sold the company in '67. By 1970, it had become a cash cow for the parent company. That being the case they didn't need me. So I left and I came to California. My father left about four months after that.

Any particular reason you chose California?

Yeah, it was very simple. I couldn't figure out how to make a living in the south of France. *[laughs]* I came out to California doing some consulting, found myself with a free day, and ended up on Zuma Beach. I looked at things, and came back and said to my wife, "Why should we live the rest of our lives in New Jersey?"

I suppose you're not the first person to have a locating revelation on Zuma Beach...

This is the sort of town where my kids could ride horses when they were growing up, where the guy who operated the "in" gate for their horse shows was also our mailman. That's the kind of town it was, and that's a nice place to live.

Now, had I been truly clairvoyant about this stuff, I would have moved to Silicon Valley, I think. But the problem was that once I was out here, I could not duplicate the lifestyle I've got here in Silicon Valley. No way.

I think perhaps you were more clairvoyant than you think, in that it's increasingly irrelevant where you live.

Not only that, but it's now turning out that being based down here has major assets for us, just in terms of the contact with the creative community and the number of people in this organization who have ties to entertainment, to television, to broadcasting, is amazing.

It's also turning out that there's an advantage to *not* being there. Up there they can get like the stockbrokers in New York who breathe too much of their own gas.

I often think of McLuhan's great line: "We don't know who it was that discovered water, but we're pretty sure it wasn't a fish."

[laughs] Exactly.

So by the late '70s, it was fairly clear that there was probably an advantage to not being in Silicon Valley. Although we've ended up here by accident, not because of any great plan, it's turning out to be really useful.

Let's get back to information. You are generally perceived to be the guru of desktop publishing, which is a fairly narrow poster for you to fit on. Do you find there's some resistance as you try to talk about information as more than ink on paper?

Well, people tend to want to label you and categorize you. I'm sure the same thing happens to you...

My dodge is to throw out so many conflicting images that they can't really come up with a poster for me to buy.

There was probably a period of time when that was a liability. It was a liability for the following reason—of all the things that we'd been working on, there was one piece that really jelled in 1985–86, with desktop publishing. The right mix of technology come together, and it just took off.

At what point did you see that happening? Did you have some kind of mystic sense of it when you first saw a LaserWriter, or was there some conversation with Paul Brainerd...?

Some background on this—we had John Warnock make a presentation to our spring conference about PostScript, in the spring of '84. This was the first public presentation made about PostScript.

Was there anything else like PostScript at that point?

No. The reason I had invited John was that PostScript was revolutionary. Shortly after that, Steve Jobs invited me up and showed me the prototype LaserWriter. I met with Steve and John Warnock and some other people involved with the project, and my first reaction to John, which he's quoted a number of times since that time, was "This is going to turn the publishing industry upside down."

It was absolutely clear that this was a dramatic development.

Then Paul Brainerd quit ATEX, because they were closing down the operation he was running up in Seattle. I called Paul and offered him a job. Paul said, well, he was flattered, and he would consider it, except he had something else he wanted to try first. *[laughs]* He said he would be in touch.

And sure enough, a short time later, he was. We met at the airport and he went through his ideas. I suggested he talk to Apple. And then I went back to the Apple people and suggested that they talk with Paul. I couldn't tell Paul why he should talk to Apple. It was a little bit of a sell to get Apple to talk to Paul, but it was clear that they would need something better than word processing software to really exploit the advantages of PostScript and the LaserWriter.

So in essence you were the instrument of serendipity?

Yeah, I tried to put them together. Because it was clear that what they were developing in hardware and what he wanted to do from a software standpoint were obvious matches.

And you were the only person who knew about both sides of the equation at the same time?

Because I'd been talking to one side and talking to the other. We have a lot of these situations, where you have these confidential conversations with people, and you can see both halves of the thing. There's a bit of a delicate thing where you have to go to the one company and say, "You know, I can't tell you why, but it's a good idea to talk to this person and here's his phone number."

Anyway, because there was a sufficient level of technology coming together all at once at a very low cost, you had an explosion in the marketplace. After that, the people who had been associated with it became identified in people's minds... "That's their schtick." In our case, and I think in Paul's case as well, it was only part of our schtick. It was part of a bigger picture.

But it took a while for people who were not involved in publishing to realize that. It's also taken a while, and is still taking a while, for people who are involved in publishing to realize that they are in the content business, not the bottle business. Bit by bit, they're realizing that.

Well, bit by bit they're retiring and dying. And new people who realize it up front are coming into leadership positions in their organizations.

This goes back to an earlier question you asked, which is basically how these changes take place. Let me give you a very parochial example of this,

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because it illustrates it very clearly.

Right now there are approximately the same number of firms in the imagesetting service bureau business that were, in '78, in the typesetting business. Service providers. Very few of these are the *same* companies. There were three successive revolutions they went through. First of all, people began bringing them word processing disks and tapes rather than manuscripts, so they had to take those in and convert them into type. Then people began bringing them not the text, but pages. They would do pages in PageMaker, and they just wanted the service provider to output them. Then people began bringing in not just pages of text, but pages that had images, even color images, in them.

Now, each one of these changes represented a dramatic change in the nature of what service they were providing. Every single time, the change was led by new people who had entered the industry, saw the technological possibilities, and went into business to provide for that new technology. Some of the people who were already in the business saw what was happening and then made the change...changed their businesses. Many did not, and they are now out of business. Very, very few people were agile enough to make it, during those fourteen years, through all three changes.

"It's also taken a while, and is still taking a while, for people who are involved in publishing to realize that they are in the content business, not the bottle business. Bit by bit, they're realizing that."

You know, you're talking about a problem which is grossly underestimated by companies which depend on technology. At the Multimedia Roundtable, I listened to the cable people arguing with the phone people about which of them would own the Wired World, and it sounded to me like a turn-of-the-century debate between Cunard Ship Lines and Union Pacific about which of them own the airline industry. I think the chances of either one of those cultures actually becoming the principal purveyor of soft commerce are fairly limited.

Well, first of all, I believe that we should have a separation between the highway providers and the people that provide the traffic.

We can talk about the way change happens slowly, but it also happens very rapidly, and that's the danger. Look what's happened to the video post-production business. Here we have an industry that overbought expensive technology. Went on a binge to overbuy it. Then right on the heels of that, we had the advent of desktop editing with Avid stuff combined with a recession. They were devastated.

Though the underlying trends may take a long time to develop, sometimes bam! you've got these changes, and people have to be really agile. The people who get blindsided are the people who are stubborn about seeing the underlying trends.

The other people who get blindsided are the people who get overenthusiastic.

There's the old saw: "You can always tell the pioneers from the arrows in their backs." Absolutely.

And I think that one of the reasons we have resisted using the word "multimedia" is that either it means nothing, because it's so general that it doesn't have any particular meaning, or you must take it to mean something fairly specific like "interactive computer-based multimedia." And if you understand it to be something that narrow and that specific, then the hype surrounding it over the past few years has been unreasonable, and has raised unreasonable expectations. This meant that a certain number of people were going to go down in flames and a lot of other people were going to have a negative reaction to it because it was so over-hyped.

I don't know if there's a good word for it, but it seems to me the point of distinction here is that we're talking about something which is digital and remains digital, in its generation, its transport, and its dissemination.

Except that, to be fair about it, it does become analog at some point, because to hear it or see it, we hear or see it in analog form. Even if we're looking at something on the screen.

Well, that's true. The perceptors themselves—the nerve ends—are analog.

But yes, the fundamental thing here is that information and entertainment are going to be prepared, analyzed, organized, disseminated, in digital form, and only put into analog form as close as practical to the recipient.

And if you look at this as part of a continuum, one part of that change is that we are also changing the model of distributing information from this mass-market, blanket-the-market approach which was forced on us by the economics of the previous technologies, to a more and more closely targeted model—ultimately one which is "demand-pull," rather than "demand-push."

But I wonder if that isn't already becoming a problem in the sense that there are fewer media sources culturally unifying in the way that there used to be. There's no Life magazine anymore, really; most of the magazines that remain are targeted to a very specific market.

Magazines are about targeting for readership. Even the larger national magazines are printed at multiple printing sites, they're distributed electronically to multiple sites. There are demographic editions of them. They do selective binding. Print is becoming very, very, very focused. Thus, my issue of *Time* magazine and yours may look different, in fact, probably do look different. Different advertising, and even different editorial content.

Now yes, I agree with you that that's a problem, but the interesting thing is that it opens up opportunities as well. The reason we started the *Digital Media* newsletter was exactly the need for something that was cross-industry. So there was a niche need to be filled there, because information about these topics had become so specialized that it was hard for anybody to get a broader view of things.

I still felt, at your Digital World conference here last week, a lot of resistance to taking the broad view. There were plenty of people in that audience who did their own particular little piece of bit-twiddling and would rather not have to know what other bits were being twiddled. They felt under some vague obligation to find out, but it seemed the whole thing was basically scaring them to death.

Yeah. But at least they were scared enough to come. *[laughs]*

And hand over a chunk of change to you!

And that's a start. The Seybold Conference we're doing this fall is by far the biggest we've ever done. It's a very large, very ambitious program, it's a very large trade show, and the people who will come to that are people who think of themselves as publishers. We think of that as being an application-focused computer show, with the applications being using computer technology to communicate information.

But the vast majority of those folks are still in the business of putting ink on paper some way or another. That's what they think of themselves as doing.

But an awful lot of them now think of themselves in broader terms.

Now there can be some lag between thinking of yourself in broader terms and actually acting on it. But just in terms of the way that we're constructing the program—and I think we're doing this in response to people's interests and need—you can go through an entire three-day track and not talk about paper at all. Because there's stuff all the way through that has to do with electronic distribution.

We wouldn't do that, except that we know that there are going to be enough people coming to the conference for whom this is very important. For example, almost anybody involved in documentation nowadays has moved away from thinking about documentation as being paper-based unless it has to be. It does not make sense to put the documentation for a 747, or a piece of computer software, for that matter, on paper unless you have no other choice.

So people are really thinking about it and really looking at the alternatives.

Well, this brings us to one of the big stumbling blocks with electronic transmission. Right now, we've got ASCII as our lingua franca, which seems very limiting. In order to find out whether something is meaningful to you, you've got to read it. In the online environment, you don't have the semiotics of formatting and the visual categorization.

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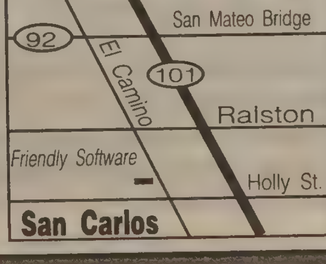

Which is why things like Adobe's Carousel are so interesting.

Right. I want to know, I guess, when you think it will become possible for me to publish online a fully formatted, richly visual magazine that anybody with a computer would be able to read?

Well, there are issues that we need to resolve in that, two of which are not at all simple.

One of them is the question of whether the format you want for print and the format you want for the screen are the same. The problem is the screen is a lot smaller and a lot lower-resolution. When you output the pages for the screen to display, you don't know how big the screen is. That's an issue we've got to work out, and we need some experience.

The second issue is that in putting something out electronically, I don't want to simply replicate on a screen what I'm doing with paper. For years the MIT Media Lab has had this 2000-line resolution monitor on which they can put up an entire newspaper page. A couple years ago, I took some of our people through the lab on a tour. Pete Dyson, one of our editors from the East Coast who was very perceptive about these things, hadn't seen this before. He looked at it and he turned to me and said, "Why would anybody want to do that?"

> *"We are also changing the model of distributing information from this mass-market, blanket-the-market approach which was forced on us by the economics of the previous technologies, to a more and more closely targeted model—ultimately one which is 'demand-pull,' rather than 'demand-push.'"*

The point is that, if I'm doing this, I want to be able to take advantage of things I can do electronically which I cannot do with paper. Which means I want structure. I want searching capability. I want to be able to annotate something. I want more than the paper gives me.

I think that we are not too far away from working out how to make this happen.

And you also want to be able to provide electronically some of the things that paper does give you—some method of giving yourself the sense of dimension and spatiality that you have with a book.

And I want to be able to press a button and get out paper hard copy, because there are times when paper is the most handy way to view something. And quite frankly, for all of our talk about this sort of thing, there are many kinds of things for which I think paper will remain, for as far in the future as I can see, the preferred way of dealing with the information.

It is a storage medium you can trust. Think of the terabytes of digital data that are no longer readable by any device.

I happen to find the magazine a very handy form. It's compact, it's light, it's colorful, it hits you with a lot of information, I can access it—I have all these visual ways of accessing it, sort of skim through it and find things and so forth. I happen to find that a very useful means of conveying information and entertainment. My point is that things of that sort, print-based things, will exist and will exist for a long period of time. But they will have to exist as part of a larger world.

But they're too slow in a world of this velocity. I write things of a political nature for a variety of different publications, and I do that with the understanding that I can publish these pieces electronically, if there's an important issue being raised in them, before they ever hit print. For example, by the time my column in Communications of the ACM gets to the readership, the issues I raise in it have often either died or been resolved in the period between composition and publication. I have to be able to publish electronically or there's no point in doing it.

Even with the newsletters we're doing, which have a relatively short lead time, my objective is to get to the point where I can publish that electronically, so that the information is timely. So that the people who want the information in a timely fashion can get it without waiting for the delay involved in putting it onto paper and mailing that paper to them through the US Mail.

But you don't want to publish in ASCII... I don't know about you, but I'm starting to get a text allergy.

We've been doing that for years—for almost ten years now we've been putting ourselves up on different ASCII databases. That's useful. I use it myself to go back and search back information. But I sure wouldn't want to read a whole 40-page issue that way. And I wouldn't want to navigate through it that way either.

So I think you're right that one of the interesting frontiers right now is finding the right metaphors for distributing this stuff in electronic form, for screen viewing and for on-demand printing. Finding the best use of the technology available, taking into account the very diverse installed base of computers and the very diverse levels of ability among their users. And also finding things which give you the ability to do things with the electronic form that you can't do with the print form.

I see us moving very rapidly into experiential formats for information that are simply nonprintable. And I hope the print hangover doesn't retard that process. I know that much of what I want to be able to communicate to people is not something that will fit on paper. As a writer I'm especially sensitive to the limitations of words as a method of conveying experience.

It's very easy for all of us to focus on what you will be able to do in the future with the technology. What we're really saying is that the range of options is going to be much broader in the future than it has been in the past, and that the interesting challenge is going to be to figure out what the best media are and how to use them best over this entire range. The range will include everything from things which never appear in paper form to things for which paper remains the means of distribution.

But don't you think we're going to see a point fairly directly where everything's on the wire—there are no media differentiations based on this form of bottle or that form of package?

The question is one of eventuality. The technology is a long way away from being able to deliver a daily newspaper into the home electronically. Not to the range of houses we want to deliver it into.

Well, first of all, I'm not sure you would want to do that. But I wouldn't say the ability is all that far away.

If you figure that you want to be able to deliver it to homes that are not technologically rich houses, I think if you look at the enormous amount of information that is contained in a newspaper, and if you look at the problems of supporting it with advertising, I'm not sure that we know what the replacement product is at this point. That's what I'm saying.

You could also say it's already being done right now by CNN.

Sure. And that as you do things like classified advertising and yellow pages and things of this sort electronically, the role of the newspaper is going to diminish dramatically. Because those are things right now for which there is no electronic substitute. But if you could sell your car by putting something up that anybody in the area could access electronically, it would be extremely attractive to you.

Do you think that most of the people who are in the information business have a real sense of how information is different from physical product?

No. That's an issue which we've discussed. I think that we as a society have trained people to think the carrier *is* the product. And the thing which is fundamental to the digital revolution is the separation of carrier from product. That's an intellectual leap that's difficult for people to make.

I certainly have a hard time getting this across.

Right. And I have this problem with everybody I deal with, from print people to the movie studio people. On one level, anyone can say "sure." But saying "sure" and really understanding it aren't the

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2D & 3D COMPUTER GRAPHICS • MULTI-MEDIA • TRADE SHOWS • PRODUCT PHOTOGRAPHY same thing. It's going to take a while for people to really understand it. We're talking basically about information being delivered out of the ether, and never having a tangible form. That's something that is countercultural for an awful lot of people.

People make fun of the phrase "paradigm shift," and I really don't know a better way to describe the depth of what has to take place before people can understand what's going to happen to information when the bottles go away.

I was going to say... You talk about concrete examples of the kind of things that people need to think about—a great many of us travel. I just spent some time traveling in France. I had to make a decision, before I made that trip, what I'd take with me in terms of maps and guidebooks. I've got these things in the house. I elected not to take some guidebooks just because of their weight, but I would have loved to have that information with me stored on my hand-held device, whatever you want to call that device, so that I could call up hotels, restaurant information, map information, travel schedules, all the kinds of things I would need.

Well, I notice that that's one of the things Sculley's talking about with Newton, and part of his demo is exactly that sort of information.

Yeah.

However, we need to remind ourselves that these things always happen more slowly than we expect them to happen, but the effects are more profound and more far-reaching than we expect.

Paul Saffo's got a nice term for this, which is "macromyopia." That is, the tendency to overestimate a major technology when it arrives and then underestimate its effects over the long run. It doesn't take very long for a technology to be developed, but it takes a long time for it to be adopted. Look at the personal computer... In spite of stunning advances in potential, 80% of them are still just dedicated WordPerfect servers. They're not doing much besides improving the efficiency of white-out.

The thing is that the more impact something has, the deeper the changes it occasions, the longer it will take those change to happen.

Part of the process is that we're having to "learn" the new media. First we use it to emulate poorly what the old technology did well. And then you get to a point of emulating better what the old technology did well. It's only when we get to the third stage, of doing with the new technology things we couldn't do with the old technology, that we get liberated. That's when we really begin to realize the potential of the new technology.

You start to have a grammar, and a definition of meaning that is based on the medium itself.

People ask us, "What is it that you guys do for a living?" And the best definition I've come up with is saying that we try to be catalysts. As catalysts, maybe we can make the change happen a little bit better, and a little bit faster. One of the things I'm really

Continued on page 258

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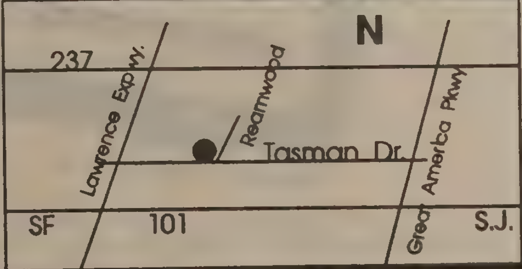
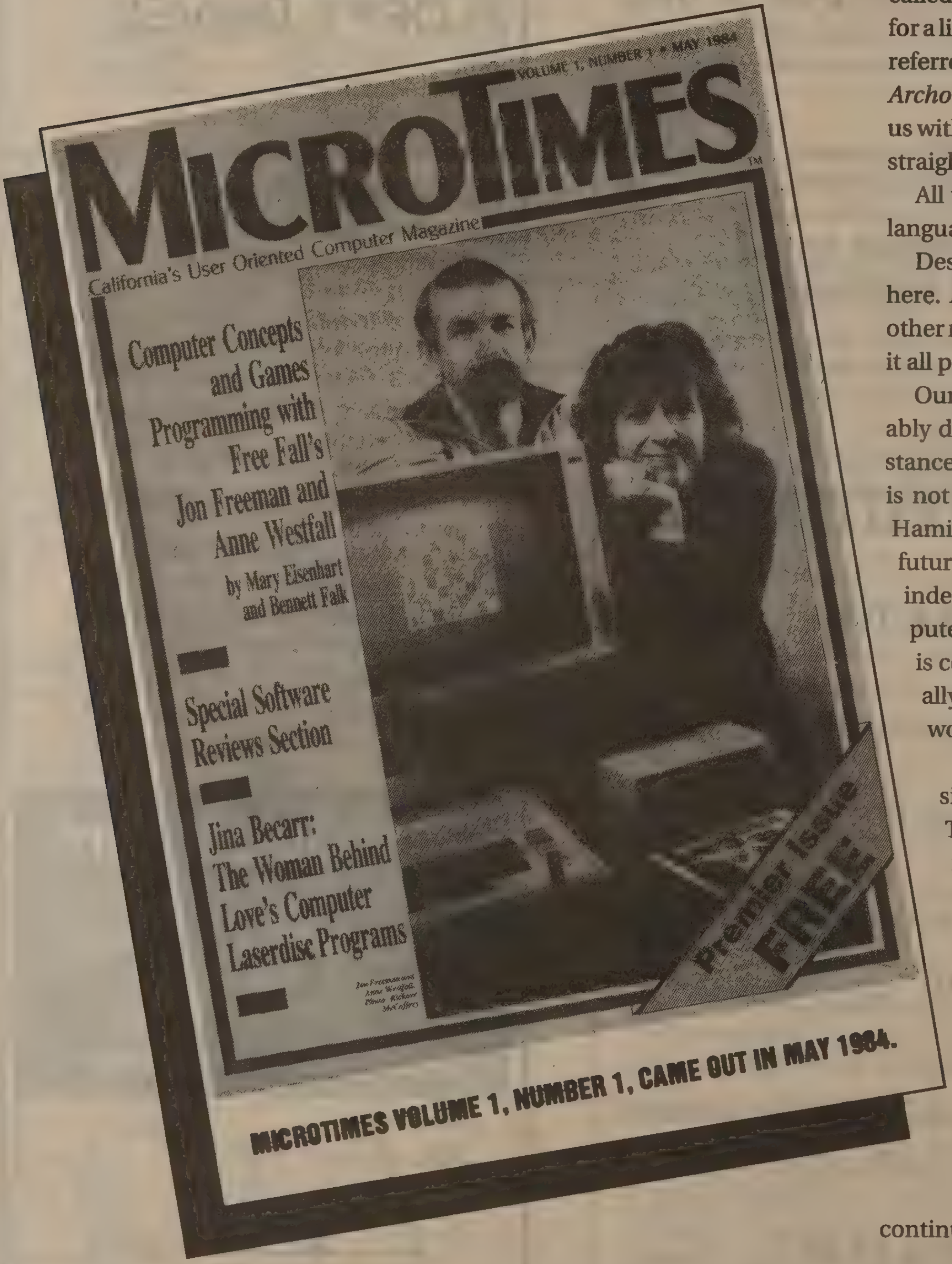


Looking Back—

In The Beginning

ACCORDING TO CONVENTIONAL WISDOM, WE PROBABLY SHOULDN'T EVEN BE HERE.

One fine spring day in 1984, I wandered into the *BAM* office to turn in a free-lance assignment. Editors Dave Zimmer and Bill Forman greeted me with the news that the boss had returned from Orange County with the idea of starting a computer magazine, and how'd I like to go interview some Computer People for the first cover story?



VOLUME 1, NUMBER 1 • MAY 1984

MICROTIMES

California's User Oriented Computer Magazine

Computer Concepts and Games Programming with Free Fall's Jon Freeman and Anne Westfall by Mary Eisenhart and Bennett Falk

Special Software Reviews Section

Jina Becarr: The Woman Behind Love's Computer Laserdisc Programs

Premier Issue FREE

MICROTIMES VOLUME 1, NUMBER 1, CAME OUT IN MAY 1984.

Being both a starving free-lancer and computer illiterate at the time, I accepted the assignment and called the only computer-literate person I knew at the time, my good friend Bennett Falk, on the theory that this was not going to be exactly like interviewing bar bands and I'd better have somebody along who spoke the language.

Armed with what turned out to be near-total misinformation from the rock 'n' roll guys as to my interview subject, I called Terrylynn Pearson, who was then doing public relations for a little software company called Electronic Arts. She in turn referred me to Anne Westfall and Jon Freeman, authors of *Archon*, then a bestselling game for EA. Anne and Jon received us with great kindness, showed us their toys, and gently set us straight on a number of misconceptions.

All the way home I was saying, "Bennett, what's assembly language? What's K?"

Despite this dubious beginning, here we are, and glad to be here. And thankful to the readers, writers, advertisers, and other members of the extended *MicroTimes* family, who make it all possible.

Our first issue came out in May 1984, in a world considerably different from the current one. It's entertaining, for instance, to go back and read that IBM's much-anticipated PCjr is not selling quite so well as expected. Or cofounder Don Hamilton's musings on Apple's *1984* commercial and the future of the newly announced Macintosh: "The personal independence message may be appealing to home computer buyers who are considering the Macintosh, but there is concern within [Apple] that corporate clients may actually identify more with the shattered screen than the heroic woman."

At the time, Apple, Commodore, and Atari were considerably outselling IBM in the personal computer arena. The home computer market, which figures prominently in our first few issues, would shortly be declared dead by John Sculley and others, but we didn't know that then... We expect that when we get to issue #200, much of our everyday reality will be as different from the current version as 1992 is from 1984. And we look forward to bringing you ongoing reports on the changes.

Next month, in issue #101, we'll feature coverage of nanotechnology, which may be one of the significant forces in our world by issue #200. We hope you enjoy this rare excursion into futurism.

Thanks for your support over the years. We hope we continue to justify it.

—Mary Eisenhart

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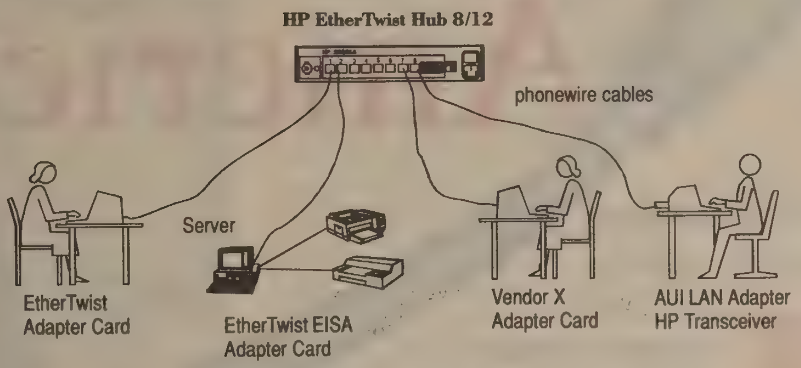

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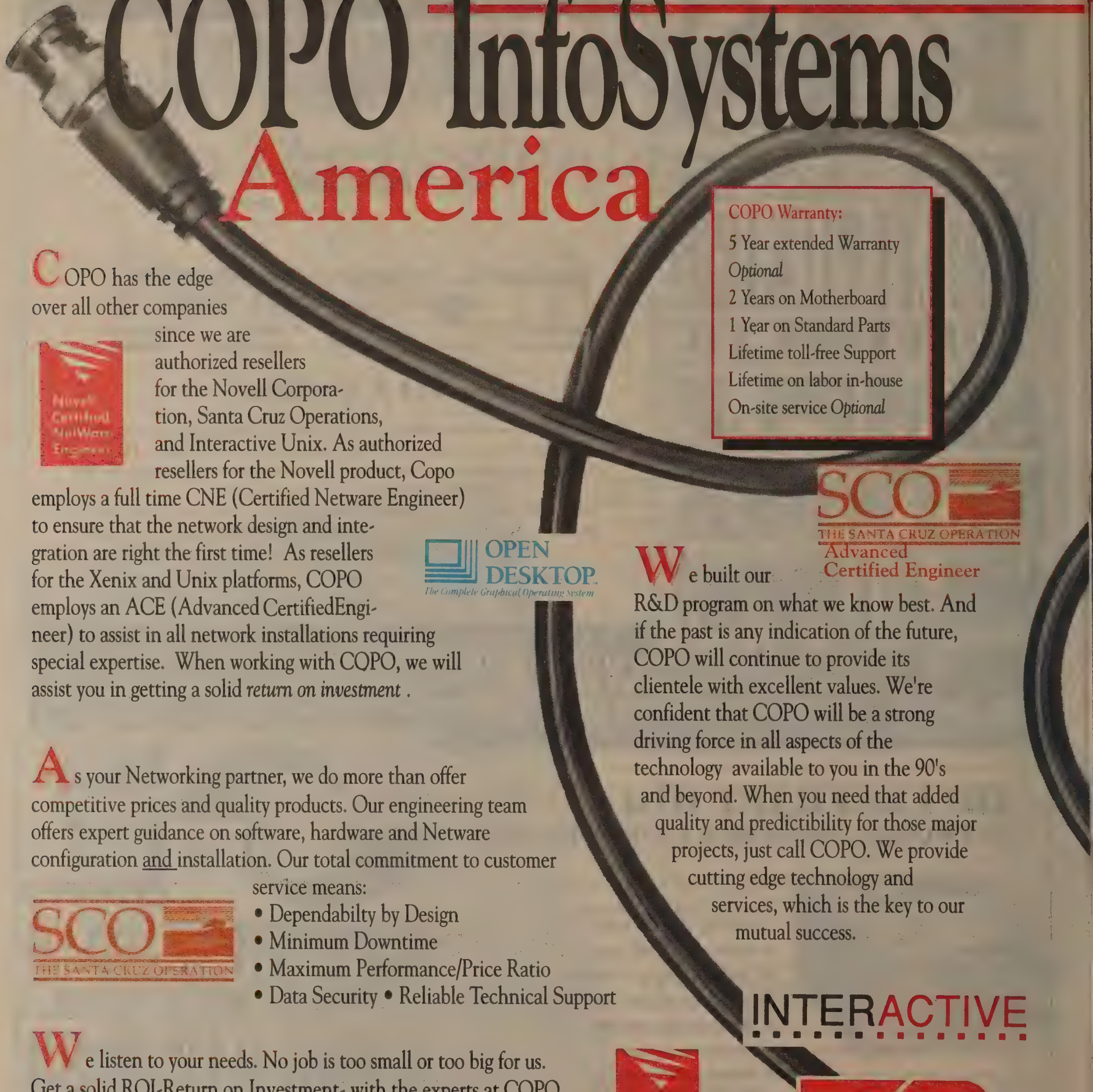

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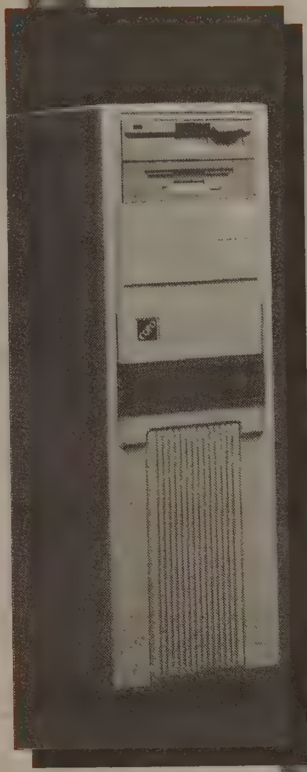

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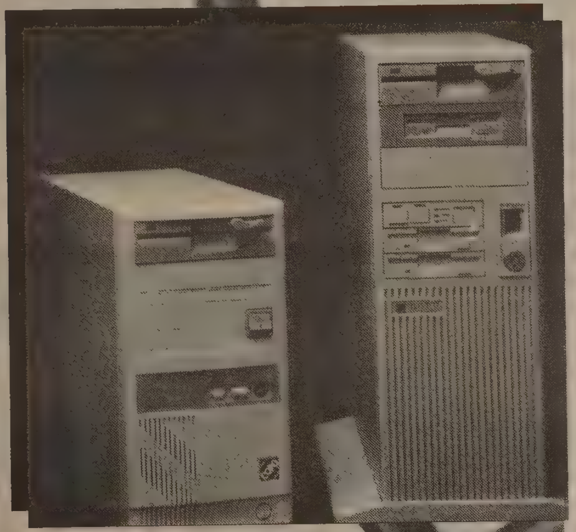

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That Was Then, This Is Now

A Few Highlights From Past Issues

As we go to press, things are far from dull in the computer industry.

Apple, which announced the death of the home computer some years back, is now heralding the dawn of its new Performa line, coming to a Sears or Circuit City near you real soon now. In the same week, it announced a truly Byzantine array of dealer channel arrangements, from VARs to catalog sales.

Judge Keeton has issued another ruling in favor of Lotus against Borland, holding that keystroke sequences are copyrightable. Meanwhile, Borland is suing Symantec over some alleged trade-secret-theft shenanigans that get more bizarre with each day's news releases. Criminal prosecution has not been ruled out.

A large group of Silicon Valley CEOs, including longtime Republicans John Sculley of Apple, John Young of Hewlett-Packard, and Larry Ellison of Oracle, has come out in support of Bill Clinton.

Anyone who thinks this business is boring probably isn't paying attention. And, as one of our contributing editors said in a slightly different context, you know it's gonna get stranger.

In which spirit we present you with a few highlights from past issues.

—*Mary Eisenhart*

California's Computer Magazine
MICROTIMES
Centram's TOPS Network:
The Mac-UNIX-PC Connection

ISSUE #29
MARCH 1987

Nat Goldhaber, Centram Systems West:

"Our objective in life is to try to connect everything to everything, and there are a few instances where we've actually done it."

A fitting prelude to Goldhaber's current mission as CEO of Kaleida, the IBM/Apple multimedia joint venture.

You say you've never heard of Centram Systems West? Shortly after this article ran, the company was renamed after its chief product, TOPS. Now a subsidiary of Sun Microsystems, the company still calls the product TOPS, but is now known as Sitka.

Establishing himself as the probable all-time champion in the undeclared Micro-Times *Never Trust a Prankster competition, Goldhaber almost sold Centram to 3Com. In fact, our Southern California edition came out with the cover story announcing the 3Com deal, leaving us deeply humiliated when it fell through while the issue was at the printers and the company was sold to Sun instead.*

Our cover story for issue #102 is an interview of Goldhaber by John Perry Barlow. We await developments with great and slightly nervous interest, but can safely guarantee a good story.

ISSUE #65
JANUARY 1990

Intel: Yesterday, Today, Tomorrow An Interview With Chairman And Cofounder Gordon Moore

MT: Do you think 16-bit is essentially dead?

Moore: Not as dead as I'd like it to be. [*laughs*]

And you know, judging by our current crop of ads, that 286 is still going…

DVORAK IN THE YEAR 2090 • TOSHIBA T1600 LAPTOP REVIEW
MICROTIMES
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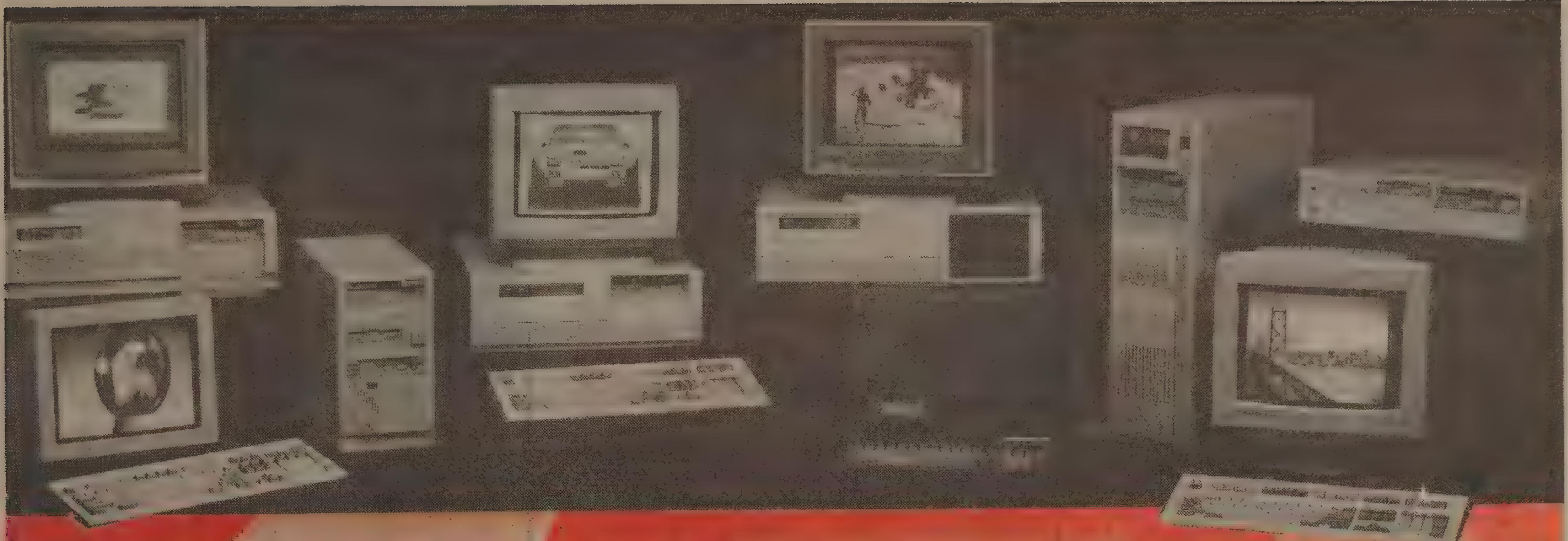
100
Our Yearly List Of Industry Leaders



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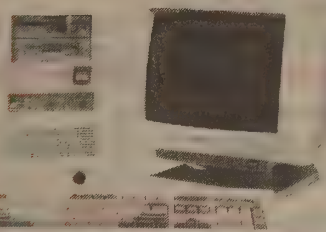

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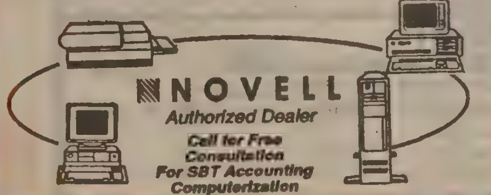

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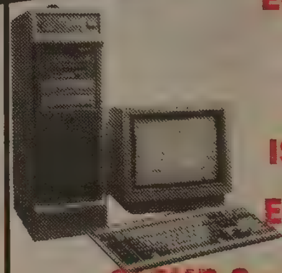

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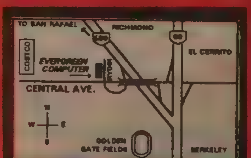

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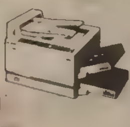

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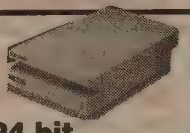

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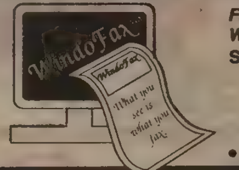
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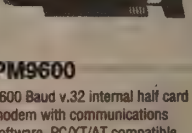

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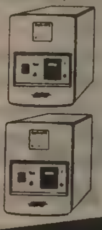

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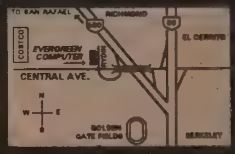

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MicroTimes: The Next 100 Issues

What's In Store As We Approach The Year 2000? A Few Opinions From Our Writers

In honor of the occasion of our 100th issue, we've asked our writers for their reflections and predictions on the years to come. They've responded in characteristically diverse fashion.

We'll start with Assistant Editor Michael Robin's views on the subject, then continue in alphabetical order. And when issue #200 comes along, we'll see what happened and what didn't!

—*Mary Eisenhart*

MICHAEL ROBIN

What will *MicroTimes*, computing, and the computer industry look like when you are reading our two hundredth issue?

The two hundredth issue of *MicroTimes* will be available shortly before the year 2000. Given the current pace of technological change, no one has any doubt that the year 2000 will look (and feel) very different.

Computers will increasingly be used as a communications tool, rather than for computation or word processing. The "killer app" of the early 21st century will be transparent, intuitive, user-friendly telecommunications software and hardware. Esoteric, system-specific telecom interface commands will go the way of keypunch cards—becoming quaint operations that used to be the way you worked with computers.

Applications in general—word processors, databases, spreadsheets, organizers, whatever utilities—will work smoothly and transparently together. This will also be true across most computer platforms.

Machines will probably be very portable, with wireless connectivity, and be deeply integrated into many facets of this society. (For instance, rather than having individual 6" screens for movies and video games on all major airlines, as United recently announced, passengers will have access to powerful computers while traveling—computers that will connect to their individual online communication center for data storage and retrieval.)

No matter what computers look like, come the year 2000 there will still be disagreements as to the best platform, the best CPU, operating system, etc. There will continue to be a variety of types of computers, each focusing primarily upon a particular user-defined function and need.

All of this will be wonderful, except...

While there will be greater acceptance of computer technology, and greater technical literacy, only the more basic computers will truly be simple to use. As everything evolves, more complex machines will remain just that, complex! High-end computers will be difficult to learn, no matter which operating system is used.

Perhaps more important, we will be entering an age where we see greater splits in society between computer-have and have-not groups. Access to computers, telecomm services, and the control of information gathered and stored on computers, will be the subject of central policy decisions.

What will *MicroTimes* look like? The copy you pick up at news racks will be pretty much the same. Ads will be organized through a HyperCard stack that includes 3-D graphics, technical information, and order forms. Stories will be formatted and available to download.

MIKAEL BLAISDELL

We have become addicted to our computing machines, unknowing. It didn't happen overnight, but subtly, building slowly and surely to the point where a failure of the computer has strong effects on all our operations.

For example, imagine (if you will) that your computer suddenly made an obscene noise and simply stopped, dead. Hard disk frozen, RAM and processor burned out, floppy disk jammed, keyboard permanently stuck—total loss, data and all. What would you do? What effect would the event have on your life and work? Extend the scenario slightly so that not only was your computer dead, everyone else's was as well. How would you continue your work? *Could* you continue?

Next, take a moment to think of the time and energy that you put into learning how to use the machine. Reading the manual, playing with the online help, experimenting with the program's functions, trial-and-error instruction. What is the value of that time to you? How many hours, at what rate? Then multiply that amount across your organization; does the total concern you? It should, for you are spending far more on support for your computer than you did in purchasing all of the software and hardware combined. And with each new purchase or acquisition of software, the toll mounts.

The next one hundred issues of *MicroTimes* should/will deal with these issues, for the days of being in love with the technology for its own sake have passed. The newest and flashiest whiz-bangs are essentially useless if they don't increase our productivity, and when it takes longer to learn to use the new resource than it would to continue working with the old, one should seriously question the value of the glittering new toy—before one buys it, rather than afterwards.

Also in the next one hundred issues, we should make "effectiveness: the doing of the right task well" a prime measure for new technology. The profession of software designer is a key part in this new approach to the creation of computing resources. Hopefully, as buyers, we will also demand and use effective performance analysis tools that will warn us of such expensive boondoggles as "Overdrives" and "Clock Doublers" before we buy them. And begin to listen to our "village idiots" when they tell us that we are paying serious money for an emperor's naked promenade.

ADAM GAFFIN

In ten years, many government records and databases will be as close as your modem.

A growing number of government agencies, from the city of Colorado Springs to the federal Food and Drug Administration, already run free dial-in databases. Other agencies, such as the Census Bureau, have opened access to their databases through commercial services like CompuServe.

Look for more and more government agencies to go online. A bill now in Congress would require the Government Printing Office to make most public federal documents available online. Falling computer and modem prices mean even small towns can afford to give the public access to local zoning codes, dog licensing information and other important, if sometimes mundane, information.

But all this easy access could ironically bring a host of problems with it. Not all of the government data going online consists of dry codes and regulations. A surprising amount of information about you is contained in public records, and more and more of it will become available to anybody with a modem. A number of federal courts now run public dial-in databases listing bankruptcy and civil-suit cases. Federal criminal dockets could be next. In Massachusetts, the governor recently proposed putting drivers' license information in a dial-in database.

WordPerfect Corporation will be the MicroPro of the '90s.

Woody Liswood

With all this and more online (why not deed data or records from divorce court?), it becomes incredibly easy for anybody to learn more about you than you probably want them to—and to combine all of this into a database that can be put to less than savory uses.

RICH GRACE

- By the year 2000, RISC machines will continue to maintain only a small market share.
- Apple will be forced to abandon the Macintosh by 1995. The Power PC will be Apple's next meal ticket.
- Intel platforms will fragment into warring camps: OS/2 vs. Windows NT vs. UNIX flavors vs. DOS. With so many Intel systems out there, there'll be room for all of them. Windows will still have the edge.
- DOS will survive. In a recessionary economy. With heavy loads of debt through all levels of society, people won't want to hear about reinvesting in a new OS and all new applications. Plus, it's still a great cash cow for Bill's Kingdom.
- Virtual reality will remain a pipe dream.
- Multimedia will fail to become a true mass-market concept. The same for pen computing.
- Commodore will be taken over, and the Amiga will fade into computing history (this from an Amiga freak!). So will the NeXT.
- The creation and release of computer viruses will be a felony.
- PC SCSI will continue to have compatibility problems, and the fragmented PC market will ensure that SCSI never becomes the accepted PC standard.
- By the year 2000, high-end microprocessors will be made in outer space.
- Lotus and Borland will merge.
- Windows programmers (and GUI programmers in general) will continue to pull their hair out. We'll have a lot of prematurely bald programmers out there.
- The first 24-bit color games will appear by 1995.
- A 32-bit GUI-based CP/M will appear.
- The distribution of dirty pictures on BBSes will become a censorship issue.
- IBM will give up on the PS/2.
- The entire world will give up on Artificial Intelligence.
- Litigation in the computer industry will become a spectator sport.
- So will documenting undocumented Windows functions.
- Bill Gates will become Secretary of Commerce under Jack Kemp.

PAUL HOFFMAN

The articles that appeared in the first few issues of *MicroTimes* tell us a great deal about our predictive abilities. No one can tell what the computer industry will be like when issue #200 comes out. Eight years is much too long in this industry: we can't even predict two years ahead with any accuracy. Look at the charts touted in the other magazines with market predictions, then look at them a few years later. They are usually way off.

What, then, can be said about what will be in *MicroTimes* issue #200? A few positive changes are likely:

- Networking will be more common, but it won't look anything like networking today. Don't be surprised to see many computers with simple peer-to-peer networking built in on the motherboard.
- There will be at least two new popular architectures that are "out of the mainstream," like the Atari and Amiga are today. They will sell about as well as the niche systems today, but will be incredibly more powerful at what they do.
- High-end systems will have multiple CPUs, possibly on a single chip. Low-end systems will have at least a graphics processor, and possibly full multimedia processors built in.

My not-so-rosy predictions:

- You will see lots of ads for computers based on the Intel architecture. The low-end systems may be based on the 50MHz 386, or the 486 if we're lucky.

Alternate architectures might proliferate, but Intel and Intel clones will still dominate.

- An entry-level system mostly used for word processing (low-end computer with monitor, hard disk, and laser printer) will cost about as much then as it does today in constant dollars. Parents will still have to agonize over price and longeivity before buying such a system for their children.
- Operating systems with command lines will still be popular.
- Modems will still be hard to install and configure.
- The computer book market will still be needed because popular hardware and software will still be too hard for the average person to use.

ED KAHN

Personal computing has a distinguished history rooted in the notion that computing can help individuals in their struggle to gain control of their destiny. From early bulletin boards, computer clubs, and hackers working to give us tools to assert ourselves against the big boys, all the way up to the notion that access to information evens the playing field, there has been the hope that computers could be a democratizing influence in society.

But as the history of personal computing has unfolded, a lot of these dreams have been trashed as we see computers used to create paperwork and red tape. There is now some question whether efficiency has been increased at all or whether we have simply made more work. It reminds me at times of the art of carving a gunstock, a good example of art for art's sake. There is no practical side to the carving. The gun works just the same with or without the carving; we have to conclude that the carving is no more than an elaborate art form.

And so it seems with much of the growth of bureaucratic demands, aided by the computer. In the pre-computer days, bureaucracy was limited in its demands for more and more forms by the limitation of how much paper-

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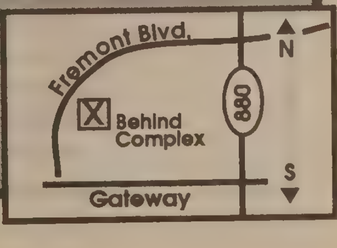

work could be turned out by the workforce. But now, with the ability to turn out reams of paper with the push of a button and the aid of a high-speed printer, more and more forms are being filled out, but with no more functionality than the carving on a gunstock.

I hope that within the next hundred issues, people will begin to address the problems being created by the proliferation of paperwork made possible by the computer. A first step will be to make a distinction between really useful work and the art form—not throwing out the baby with the bath water, but rather making the distinction, then working to eliminate the nonproductive work, or at least identify it as an art form and not inflict it upon the unwilling.

We can use computers as tools for art as well as tools for humanizing the world, but these problems must be faced and addressed.

> **Computers will increasingly be used as a communications tool, rather than for computation or word processing.**
>
> *Michael Robin*

MATTHEW LEEDS

Ten years ago I was computing on a Commodore 64 equipped with an 8-bit processor, a spacious 64K of memory, a pair of 170K floppy drives, a 1200 baud modem, and a nine-pin printer. It was state of the art.

Things have changed; they will continue to do so. What hasn't changed is that I'm still using a keyboard, still using a CRT-based monitor, still using floppy disks, still need to have an esoteric body of knowledge to get full use out of my system, and still can't take my computer with me unless I carry a bag that weighs more than a newborn infant.

Computers are mostly about managing information (as is much of business these days). It doesn't really matter if we will be using Windows NTXYZ, System 9.9, or PenPusher OS. The real, important changes in computing over the next ten years will revolve around user interface and information access issues. Faster CPUs, more memory, intelligent agents, various pen and voice recognition systems, all these and more are just the supporting frameworks for better user interfaces (read: easier-to-use systems).

The relative ease or difficulty of getting information, managing information, and disseminating information will be the single largest issue over the next ten years. Already cable television companies, telephone companies, software companies, record companies, newspapers, and all of the other information suppliers are battling for control of the information access infrastructure. Who will own the data pipe at your home or office? How much of the infrastructure will the government (read: you) pay for? We are already seeing subsidies similar to those in agriculture and transportation. There has been little public debate on these issues, and little public awareness of the scope of the issues. Hopefully over the next hundred issues you'll see an increasing amount of debate and discussion on these and related issues.

FREDRIC LIEBERMAN

John Cage—composer, inventor, philosopher, pioneer—died last month.

Now recognized as a major force in contemporary art and aesthetics, Cage said in the 1960s, almost wistfully, "My problems are no longer musical, they are social." That is, though he thoroughly enjoyed his compositional explorations, he was usually dismayed at the negligence of performers, who were sometimes actively hostile, often turning concerts into bad jokes or near riots. It was an interface problem, a social problem. It took about forty years for performers and audiences to come to grips with John Cage.

Despite the exponentially-accelerating pace of modern technology, I hope that the 200th issue of *MicroTimes* will celebrate not just the newest, smallest, fastest, and slickest technologies, but also the overcoming of social barriers that prevent more than a small fraction of today's personal computing power from being used effectively.

For example, all faculty offices at my University are hard-wired into the campus network, with international gateways allowing near-instantaneous email, discussion groups, data access, and numerous other services. Nevertheless, many faculty who routinely use their computers as word processors to churn out scholarly publications are intimidated by the plethora of unfamiliar interfaces needed to access QuickMail on the LocalTalk Network, or Internet or Bitnet via the UNIX mainframe. Computer communications should be easier than using the telephone.

It should be possible to type in a name, perhaps narrowed by a country, state, or city of residence, and see a list of "matches" without knowing what net, commercial service, or routing is needed—if the individual has no email account, the computer should ask if a fax will be OK. Once a recipient is identified, future messages will be directed automatically.

Similarly, information access should be dramatically enlarged and simplified. Copyright legislation must be changed to reflect the era of instantaneous electronic communication. All public domain texts, library catalogs, and databases should be available without intervention by a librarian, indexed and cross-indexed transparently to the user. If I want to know where to find a particular book, typing in some combination of subject, title, or author should generate a list of matches from *all* sources, with suggestions as to the closest or most efficient ones and, hopefully, an offer to display any or all of the text immediately.

The heroes and heroines of *MicroTimes*'s issue 200 will be those who solve these problems of interface and access to information.

WOODY LISWOOD

- Pen computers will be a major financial and emotional bust for multitudes of companies. Pen computers will be the new black hole for the venture capitalists who are into wishes rather than reality.
- Windows, the DOS-based GUI environment, will become all-pervasive. Windows NT will become the standard operating system for the majority of small networks.
- The mainframe computer will become solely a monster storage warehouse; productive work in the majority of businesses in the United States will still be done on the per-

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47485 Seabridge Drive, Fremont, California 94538, (510)490-4300 sonal PC, which may or may not be connected to a network. I still haven't met a network I like, but the LANtastic peer-to-peer operation comes close.

- •IBM will enter the clone market and finally become extinct.
- •Email and group productivity software will become pervasive, and there will be major battles in large and small organizations as to the standard suite of software to be shared on networks. The major players will boil down to Microsoft, Lotus, Borland, and Novell. The software suites published by these organizations will own 95% of the marketplace and be almost identical in function and interface. If Lotus doesn't figure out how to get 1-2-3Windows up to the level of Excel, Lotus will be a distant third.

> **The computer book market will still be needed because popular hardware and software will still be too hard for the average person to use.**
>
> *Paul Hoffman*

- •WordPerfect Corporation will be the MicroPro of the '90s. What sold WordPerfect for DOS was support, not ease of use or functionality. WordPerfect for Windows is a major disaster, and probably cannot be fixed. WordPerfect will eventually fade away, leaving thousands and thousands of current WordPerfect for DOS users trying to figure out how to reclaim the billions and billions of brain cells dedicated to memorizing the arbitrary and capricious set of function key commands which don't make sense in any GUI environment and never made sense in DOS.
- •I may finally find a Windows, or maybe even a DOS, database that I like. I still find that the output of data is more important than the input of data; sometime, somewhere, someone will look at the old InfoStar database report writer, realize that it is still better than anything being currently sold under DOS or Windows, and move that functionality to Windows and finally drive the dBASE language and clones back to the murky depths of programmers' hell.
- •Every year, for the next hundred issues, will be the year of UNIX. UNIX guru types will still spend their time creating shells for UNIX so that UNIX can appear as anything you want it to be. Most normal people will still not be able to understand anything told to them by a UNIX nerd.
- •Apple will finally decide that the computer for the rest of us is based on the Intel chip and the Windows NT environment. It will become a major clone maker and reduce prices to compete in the PC clone marketplace, because folks will finally decide that raw computing power and price are more important than yuppie symbolism. Mac-noids will rebel, but no one will listen, and the noids will line up and dive into a PC screen to disappear into their own personal TRON.
- •We will see no Killer Application within the next hundred issues. I will spend most of my writing and reviewing time doing update articles about the next five thousand features squeezed into my favorite programs. Also, I finally will find that I can't use most of those features, but that I don't really care anymore.

BROCK N. MEEKS

The electronic landscape will sound a lot like George Orwell's *1984* or reruns of that far-sighted, yet ill-fated TV show, *Max Headroom*. I say "sound" because when trying to describe this landscape, it will all be so much "double-speak"—let me give you just a few examples.

The networks will be government; government will be the networks. Spectrum will be the currency of choice, a commodity to be bought, sold, traded, cheated, lied, and pledged allegiance to. Everything revolves around spectrum—there's only so much of it. Once it's "used up" (read: allotted) it's gone. You don't get more of it; you can't purify used spectrum and get clean, virgin frequency. And the networks (natch, governments) will own all spectrum.

There will be no more phones, no more modem frequencies, fax frequencies. Forget 9600 bps, V.44 bis, or MNP5. These won't be needed, and indeed, they will have been cannibalized by the Federal Communications Commission—now one of the most important agencies in Washington, usurping spots once held for the likes of Justice or Treasury. The FCC will have taken all spectrum and given it to three four major networks. These networks, all employing the latest developments in Video Dial Tone, will deliver all types of communications, entertainment, and information. You will call your mom or senator by speaking to the large, flat color screen mounted on an entire wall of your living room. Mom's face will fill the screen as she whines about the current state of disrepair your front room (or your marriage) is in.

Because the networks own the spectrum, they will own you. You, of course, have only one choice—which network to "subscribe" to; actually, it's more like "pledge allegiance to." I put "subscribe" in quotes because, actually, you'll have no choice but to pick one of the networks—even if you don't want to subscribe, you can't communicate, you can't traffic in any kind of commerce; hell, you can't vote if you don't have a network subscription.

So, you see, spectrum is currency. *Epluribus spectrum*; in frequency we trust, whether we like it or not.

The breaking cover story of issue 200? That's easy: "FCC Overturns Lower Court Appeal to Ban Off Buttons; Networks Hail Commission's Ruling as 'Dawn of New Era.'"

DAVID MORGENSTERN

Question: If all one hundred issues of *MicroTimes* were laid end-to-end, how many circumambulations of the BMUG office would result?

This question will require some extended number crunching to calculate, since the sharp volunteers on the BMUG HelpLine, energetic members in Special Interest Group meetings, and our hard working staff, would totally get in the way. BMUG thanks *MicroTimes* for helping us give away information!

Let's get out the Ouija upgrade board, and check out the 200th issue!

Is there much point in running through the fantastic techno-toys that we'll see in the next eight years? The PowerPC, digital signal processing add-ons, palmtops, everything faster, bigger, and better. Think of the distance from the original Mac to the Quadra 950—will our future machines have that same relationship?

I bet that the frantic rate of change that we've seen this past decade in desktop ma-

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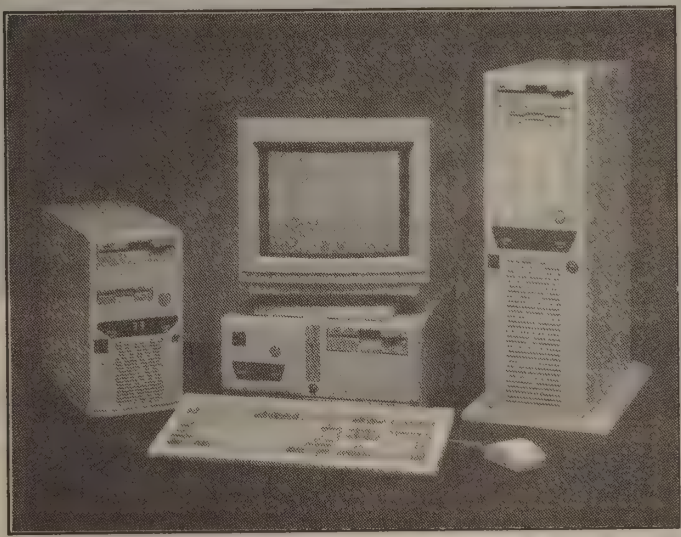

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chines will slow down a byte. This will only partly be due to the current recession, which will continue until the computer industry and the general economy can wean itself away from the military gravytrain. Manufacturers will have trouble moving users away from their current machines and operating systems without a compelling need, as we've seen in the DOS world. The vast majority of all computer users still only use their computers as groovy typewriters.

> **IBM will enter the clone market and finally become extinct.**
>
> *Woody Liswood*

The bigger problem will be with software. Software will be the stumbling block. Operating systems are getting more complicated and packed with exciting features.

This is so bad, you say? Digital video and audio, improved imaging models, voice recognition, optical character recognition—Yes! But third-party developers are having trouble fitting the technologies into their programs, and users are having difficulty integrating the features into their working patterns. It's taking longer than expected to bring plain vanilla System 7 fully into applications. Object oriented programming will help programmers. Eventually. "Intelligent programs" will help users. Someday. Soon. We promise, maybe in the third quarter.

The next two handsfull of techno-years will be full of exciting educational challenges, in the courtroom, legislatures, and networks. BMUG has recognized the need in the computer industry for an independent body, representing the interests of all users. With its diverse membership, and commitment to service, BMUG has felt empowered to exercise that voice. We hope you will be with us, as supporters, members, and volunteers.

TONY REVEAUX

As I leaped out of the minishuttle and hurried towards the platform of the Warm Springs BART station, the dayglo logo of *MicroTimes* blinked from an autokiosk. I altered my trajectory between the rush of Iraqi workers returning from the AramCo refinery and a flock of Hare Moonies on their way to save The City, to see if a new issue was in.

Happy-happy, joy!-joy! It was issue # 200! I grabbed a *MicroTimes*, careful that its 600-page bulk didn't drop on my open-toed BirkenSkates. The hologram on the cover shimmered, the way they always do on newsprint. It was a smiling Steve Jobs and his new CoDA (what's next after NeXT?) machine, whose operating system—SQZ-ME!—was supposedly way beyond OOPs.

Once wedged in a seat on the BART train, I started turning the mound of pages. Pulling out my OreO Personal Digital Assistant, I actuated the datastripe scan mode. After passing the soapbar-size OreO over the advertiser index, I penned in a query to find the lowest price of a portable CD-ROM recorder. A page number came up on the color LCD screen, and the familiar jingle of the Phryes chain chimed out of its microspeaker. I browsed some more through some of the other advertisers' datastripes. I liked the 3-D clip art samples from TripleClick, but quickly squelched the Yoko Ono karaoke sound bites from Galactamedia. My attention was caught by the After Darque ad—it offered three downloadable FaceSaver modules. I queried the OreO's memory status, and got a green LED with "1.36MB will remain" on the screen, so touched the stylus to OK just as we pulled into the Embarcadero station in San Francisco.

Once at my office, I checked my Mac IIIcz, and the orange LED indicated that I had videomail. I put the OreO on the desk so it could assume its role as a cordless mouse, and pressed the Chat button. The IIIcz and the OreO engaged in a lightning-fast interchange, mutually updating each other, visible on the flat, wall-hung screen of the Mac only as a blur of data. Before I read my videomail, first I wanted to try out the new FaceSaver modules

In the video mode, I selected Outgoing, so the screen displayed what the minicam built into the monitor frame saw; me, against the bluescreen background panel built into the backrest of my swivel chair, and connected by a wireless link to the Mac. Hmmm...was a comb always part of the standard business desk accessory kit? I opened the first FaceSaver and selected the Demo for "Big Ferns." The green wetness of the Cretaceous era primeval swamp was certainly interesting. But when the pterodactyl flew behind my head with the obligatory "Ook!Ook!Ook!" I felt it was time to go on to the next one, labeled "Cousteau." Gee, the colors and light textures of a tropical reef under water were shimmeringly beautiful, but I couldn't help holding my breath. Ahh, this one, "Astro Journey" looked promising. Framed by the viewport of the starship Ventureprise from the TV series, *Star Trek, the DeGeneration,* I was tooling through the rings of Saturn, and ready to start my business day. Wow—it's just one motion-fax after another!

BIRRELL WALSH

Want to make a buck between now and 2000? Here are three ways:

Network Navigation: The interlocking of computer systems will continue and accelerate. The hardware and the software will be expensive to develop and hard to fund. Leave that to the big players.

But every new connection means that people are going to need to find their way around. How do you get a letter to your friend who is on another network? How do you check into a Finnish university? What are the commands for virtual universes operating in France?

People will need help for the networks: travel guides, navigation information in books and online, cheat sheets for various networks, even "travel agents" who will handle all the interaction for you. Most of these niches are unfilled today.

Interface Design: How do you control a computer while bicycling? How does someone who has no vision operate a computer? How can a multilingual population share an interface? How can a computer provide "tactile output" in a virtual world? Can computers communicate with animals?

The Americans With Disabilities Act requires accessible work- and living-places. That will mean new kinds of pointing devices, new kinds of voice input and voice output, varieties of tactile output, and "glance-and-blink" control. Each of these hardware families will be useful far beyond the disabled community. Each is in its infancy.

And don't forget software. What is a good

Continued on page 262

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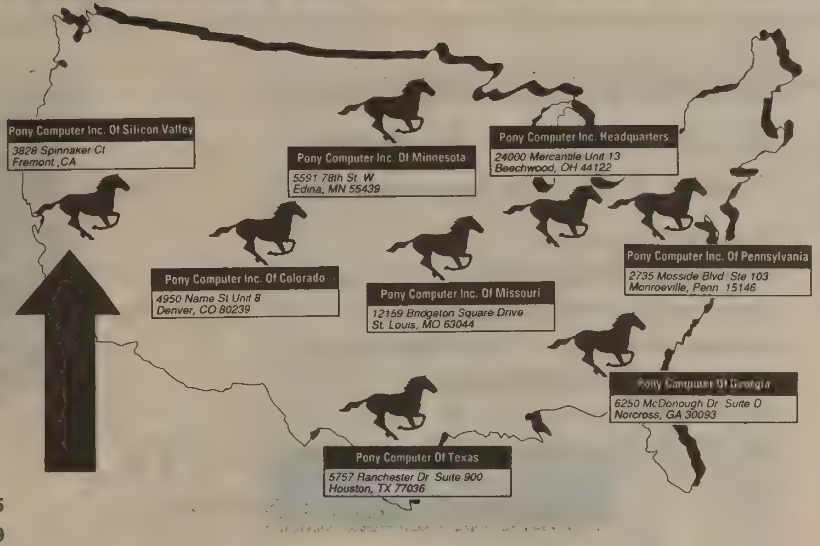
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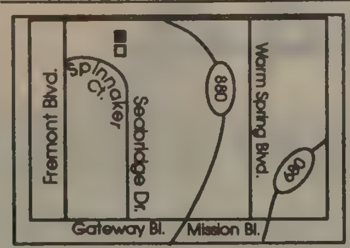
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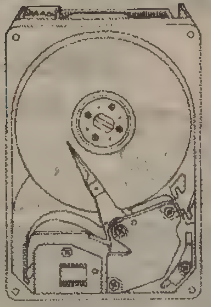

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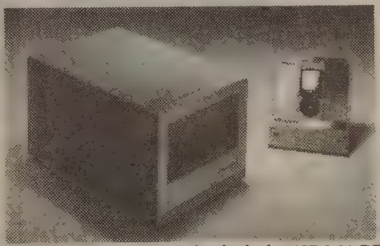

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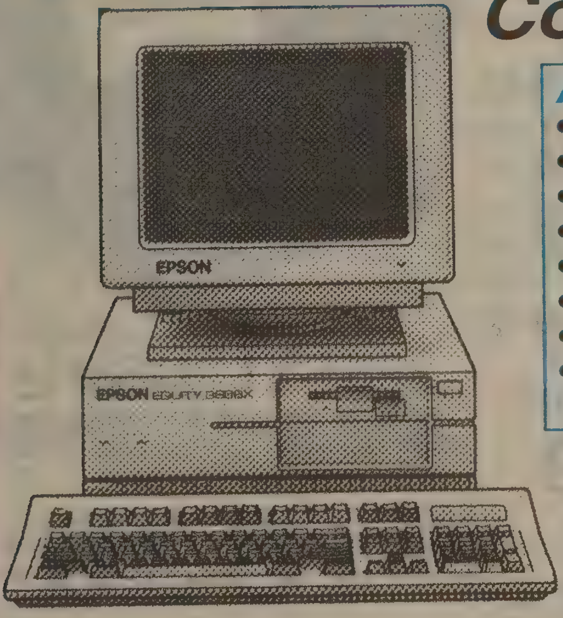

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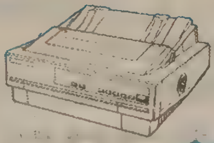

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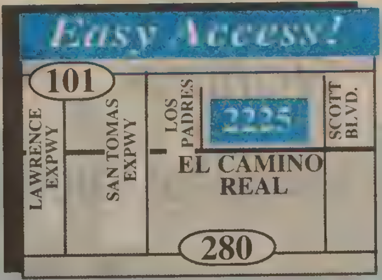

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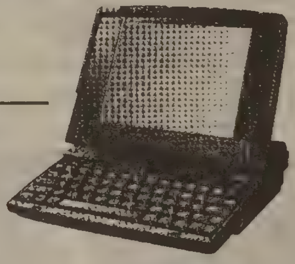

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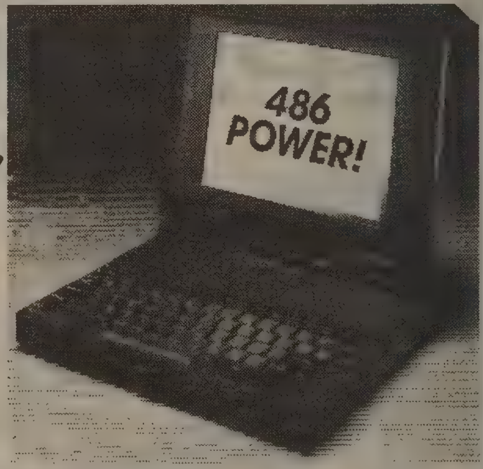

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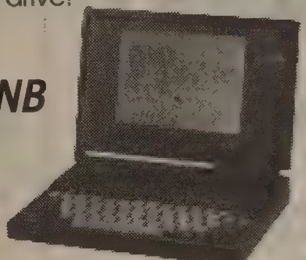

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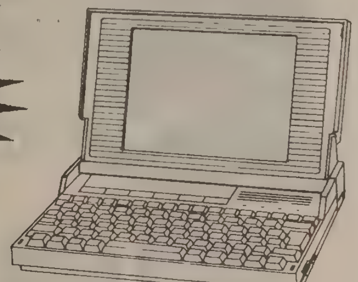

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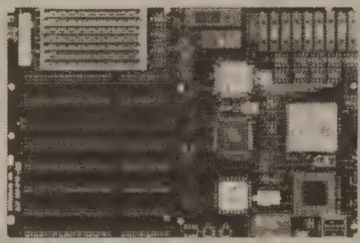

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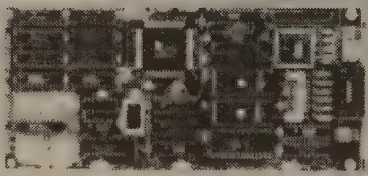

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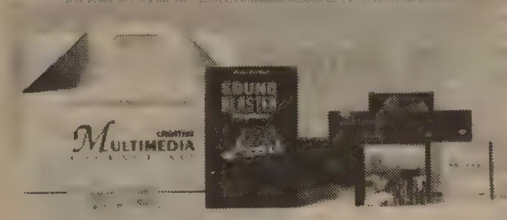

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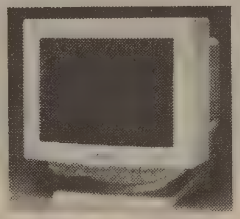

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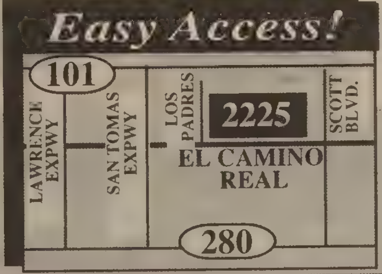

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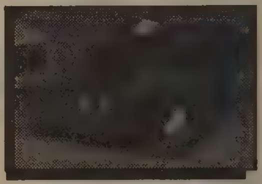

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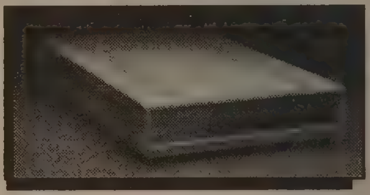

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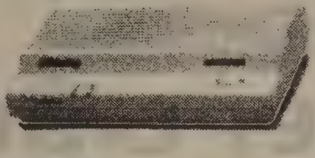

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-Additional CCITT and Bell compatibility with 2400/1200/300 dial-up modems
-CCITT V.25 for calls originating outside the U.S. and Canada

- Error control (both CCITT V.42 & MNP 2-4)
- Data compression (both CCITT V.42 bis & MNP 5) for throughput up to 57,600bps!
- Auto-Answer/Auto-Dial
- Nine LED status lights

*Sportster 14,400
High Speed Data*
CCITT V.32 bis with V.42 bis

Internal	$309
External	349

*Sportster 14,400
Fax Modem*
CCITT V.32 bis with V.42 bis

Internal	$329
External	369

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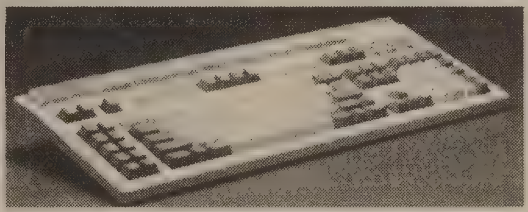
Authorized Keyboard Dealer



Skin Protectors $19.95 Each

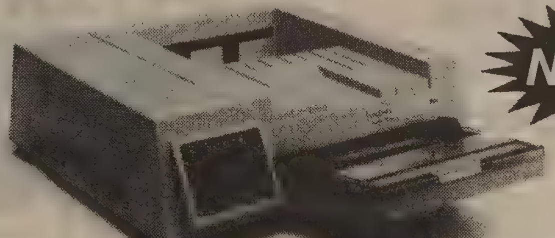
OmniKey™ Keyboards

101S	$59
101NI	79
102	79
UltraT / UltraF	99

Also Available for PS/2, AT&T & Tandy

OKIDATA® LED Page Printers

OKI OK!



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**PC Magazine®
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- Industry's best warranty: 5 years on printhead, 1 year parts/labor on printer
- PC Magazine Editors' Choice- June 12, 1990
- 4ppm, 300dpi: crisp blacks, publication quality output
- More standard typefaces/fonts than LaserJet™ IIP
- High-capacity 200-sheet paper tray included
- HP® Series II compatible
- Design fits any desktop

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*With OKI
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- High-capacity 200-sheet paper tray included
- HP® Series III compatible
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9-PIN		
•ML-320	300cps	$319
•ML-321	Wide Carriage	459
•ML-3410	Fast 550cps! 8-part forms	1299

24-PIN		
•ML-380	192cps, 63cps LQ	229
•ML-590	NEW Auto Form Sensing	*CALL*
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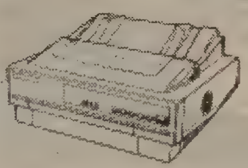
WHEN YOU'VE GOT AN EPSON, YOU'VE GOT A LOT OF COMPANY™

NEW FOR '92!

LQ-570

$269

- 24-pin, 315cps
- 12 built-in fonts
- 2 year warranty



LQ-1070

$389

- 24-pin, 315cps
- **WIDE Carriage**
- 2 year warranty

Action Printer **AP-3250 24-Pin**

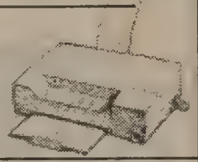
Ideal for home use!
Easy Operation

***$189**

In-Store Price $199

*Reflects $10 Mfg.'s Mail-In Rebate!

- 200cps, 360x360
- 24-pin scalable LQ fonts
- 50 sheet paper cassette
- 2 year limited warranty



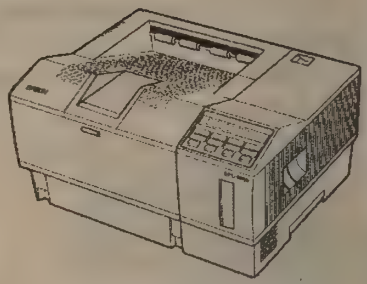
DOT MATRIX

LQ-510 FREE Multi-font Module	$219
LQ-870	458
DFX-5000	1299
LQ-1170	$599
FX-850	308
FX-1050	429

EPL-8000

13 Scalable fonts!
Printer Sharing!

Ideal for the Multi-user!

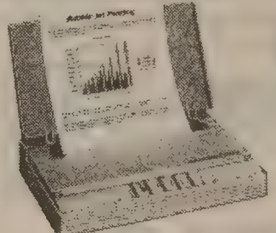


$1288

10ppm!

- 10 ppm, **1MB RAM** exp. to 7.5
- PCL-5, 13 scalable fonts
- Includes RITech for crisper, sharper images
- **Built-In printer sharing**
- 2-year warranty

Canon



Portable Bubble Jet BJ-10ex

Light Weight & Portable!

Perfect for any notebook or Laptop!

- Prints up to 83cps
- Text & graphics up to360dpi
- Uses plain paper & transparencies
- 1-year warranty

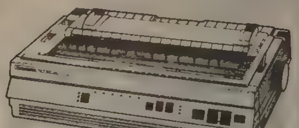
$289

BJ-20 Auto Sheet Feeder **$399**

BJ-300/330 .... 469/599

BJC-800 Color Bubble Jet **1999**

Panasonic Office Automation



2-YEAR WARRANTY

SAVE up to $150

KX-P1124*i*

High-Speed Letter Quality!

- 24-pin, 12K buffer
- 300cps, 100cps LQ
- 8 built-in fonts
- 360x360 dpi
- 2 year warranty

SAVE $70

$219⁰⁰

KX-P1123

24-pin printer at a 9-pin price!

- Narrow Carriage
- 24-pin, 12K buffer
- 192cps, 63 cps LQ
- 4 built-in fonts
- 2 year warranty

SAVE $30

$169⁹⁹

KX-P1695

High-Speed Business Printer!

- WIDE CARRIAGE
- 9-pin, 16K buffer
- 330cps, 66cps NLQ
- 6 built-in fonts
- 2 year warranty

SAVE $150

$199⁹⁹

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WARNING: MAC USERS!

Don't Buy a PostScript Laser, Until you SEE the

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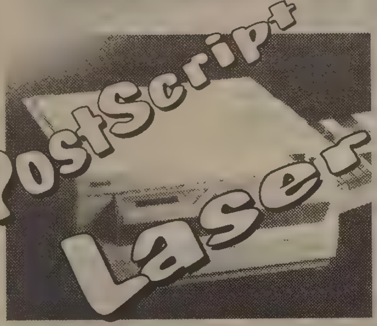

IBM & MAC Compatible!

- 6 ppm, **2.5MB** exp to 4.5MB
- 35 scalable typefaces
- PCL 4 • 1 year limited warranty
- Optional font cartridge support

Abaton by **EVEREX**

$999

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DeskJet IBM		$399
DeskJet Color IBM		599
IIP *Plus*	4ppm, PCL-4	799
IIIP	4ppm, PCL-5	999
III	8ppm, scalable fonts	1499
IIID	8ppm, dual tray, PCL-5	2295
IIISi	17ppm, auto interface switch	3499

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II/III	IIP
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PaintJet XL	1699
PaintJet XL300	2299

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ScanJet Color with interface	1450

It doesn't Scream, ... it whispers.

Panasonic Office Automation

The *QUIET* Series Printers

Come Hear the Difference! **43.5 dBA!**

KX-P2123
- 24-pin letter quality
- 240cps, 64cps LQ
- 6 fonts, paper parking
- 2 year warranty

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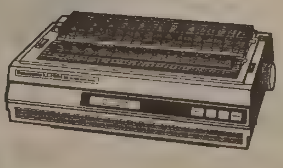
2100 Series Color Option Available $49.95

KX-P2124
- 24-pin letter quality
- 320cps, 85cps LQ
- 8 fonts, 360x360
- 2 year warranty

$339



KX-P2180
- 9-pin matrix
- 192cps, 38cps NLQ
- 6NLQ fonts, (45 dBA)
- 2 year warranty

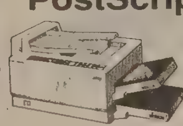
$159

*FREE Adobe Type Manager! W/ Purchase of 2624, 2124, 2123, & 2180

KX-P2624
- 24-pin letter quality
- 300cps, 100cps LQ
- 11 fonts, 26K buffer
- 2 year warranty

$379

KX-P4455 PostScript Laser



$1699

Accessories for 4455/4450i

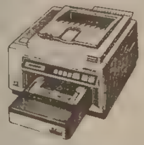
Legal Tray	$49
Envelope Tray	69
Toner	39
Drum Unit	149
Developer	99

- 2MB RAM exp to 4MB
- Two 250 sheet paper trays
- 39 PostScript fonts • 11PPM

POSTSCRIPT

KX-P4450i $1099

KX-P4430 Laser Printer



NEW!

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Scalable Fonts!

- 1MB RAM exp to 5MB
- **PCL-5 Scalable**
- 300 dpi resolution • 5 PPM
- 200 sheet paper capacity

KX-P4410 Laser Printer

*FREE Adobe Type Manager!

5ppm!

***$629**

- 512K RAM exp to 4.5MB
- 200 sheet paper capacity
- 300 dpi resolution • 5 PPM

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KX-P1180i	$159	KX-P1695	$348
KX-P1124i	289	KX-P1624	348

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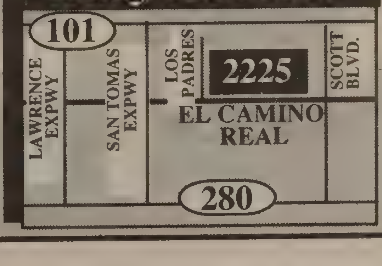
Easy Access!



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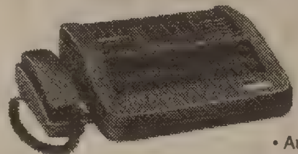
As your communications needs grow, you can rely on Murata. Backed by toll-free telephone support, sales and service networks nationwide, and our Full Circle Service™ program (which even includes house calls if necessary), featuring 90-day parts/labor on-site warranty. Murarta fax machines are built for the most important business in the world. Yours.

Quality Faxes, At Affordable Prices!

The Desktop Business Fax...
With Automatic Paper Cutter



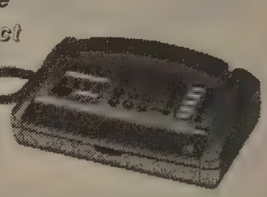
$399

M1500

- Auto paper cutter
- 10-page auto doc feeder
- 16-level grayscale
- Stores up to 20 numbers
  -10 one-touch, 10 speed-dial
- Prints conformation reports

Fax, Phone & Copier
For the Home

UltraCompact Design!



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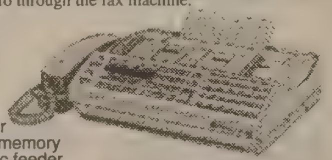
M750

- 20-number autodialer
- Weights 5 1/2 lbs.
- Fine resolution mode
- Built-in, pre-recorded "voice-on-chip" prompt

A Full-Featured Fax Able to be Connected to your PC

Allows transmission & reception of computer info through the fax machine.



F-38

- Auto paper cutter
- 16-page CCITT memory
- 10-page auto doc feeder
- 16-level grayscale
- Stores up to 70 numbers
  -20 one-touch, 50 speed-dial
- Polling, real-time or delayed
- Computer interface capabilitites, RS232 port
- **Optional computer software kit available**

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Quality *IMAGE-MATE* Fax Paper by Murata

Hurry! Limited Quantity!

2 ROLL 49' PK $3.99
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4 ROLL 98' PK $9.99
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The Efficient Business Fax
...With Practical Fax Features

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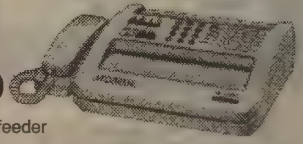


M1000

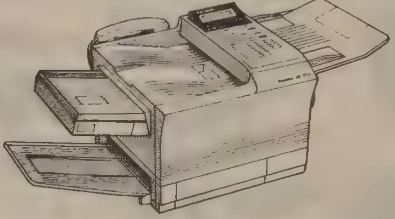
- 10-page auto doc feeder
- 16-level grayscale
- Stores up to 20 numbers
  -10 one-touch, 10 speed-dial
- Prints conformation reports

Panasonic
Office Automation OA

Curling Up Is Hard To Do!

Plain Paper Faxes at Affordable Prices.

High Productivity Plain Paper Laser Fax with Dual Access!



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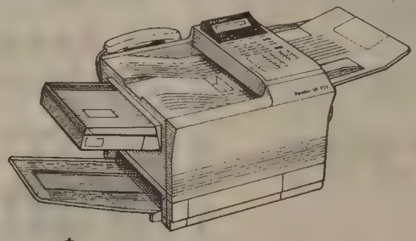
UF-766

- Time batch transmission
- Fast 3 second quick scan
- Dual Access operation
- 30-page auto document feeder
- Programmed up to 143-stations
- CCITT Error Correction Mode
- 64-level halftone
- And much more...

Plain Paper Laser Fax with Convenient Memory Functions!



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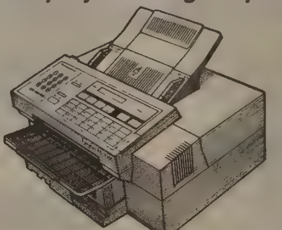
UF-733

- Crisp clear laser technology
- Fast 15 second transmission speed
- High capacity 250-sheet paper cassette
- Standard 20-page memory
- Programmed up to 70-stations
- CCITT Error Correction Mode
- 16-level halftone
- And much more...

Plain Paper InkJet Fax that handles multiple jobs at a great price!



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UF-312

- High resolution 300dpi copy quality
- **Simultaneous multi-functions**
- 28-page memory
- 20-page auto document feeder
- Error Correction Mode
- 32-level grayscale
- 100 location autodialer/redialer
- And much more...

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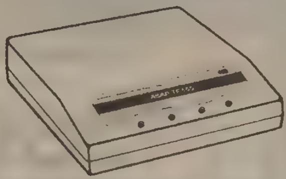
The **ASAP**® can eliminate the dedicated line you use for your fax, computer or other telephone device, and make your current phone lines work more efficiently.



ASAP CF3000

The perfect choice for anyone wanting to switch between a computer modem and fax automatically. #FSW3000

$74

ASAP® TF300*plus*

• Access codes • TAD/phone ring count • Automatic ring reduction • Extension detection • Automatic fax detection • Automatic TAD-to-fax transfer #FSW300

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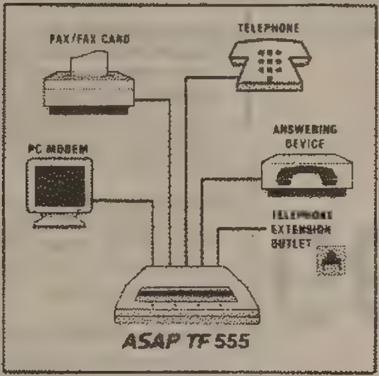
PC MAGAZINE EDITORS' CHOICE

ASAP® TF333

• Automatic ring reduction • Open line notification • Extension detection • Automatic fax transfer • Automatic fax (CNG) detection • Fax access code • Ring numbers before a call • Available rings to the TAD/phone ports • Available rings to the fax port • Phantom ring type #FSW333

3 Ports Available! **$96**



ASAP® TF555

• Access codes • Ring delay • TAD/phone ring count • Fax/auxiliary device ring count • Automatic ring reduction • Open line notification • Extension detection • Automatic fax detection • Automatic reverse modem detection • Automatic TAD-to-fax transfer • Ring signal #FSW555

4 Ports Available! **$119**

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Prices Too Low To Print!
Call for the Lowest Price!

PC500 Flip-Phone

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- 30# memory
- 75 minute talk
- 20 Hour standby
- 1 Battery
- 1 Year warranty

Tote Phone

- Full 3 watts of power
- 30 Number memory
- 7-Digit LCD display

$CALL

PC900 Flip-Phone

$CALL

- 100# Alpha memory
- Quick Charge
- 2 Batteries
- 3 Year warranty

Portable 8000HX

$CALL

- 32 Memory locations
- 16 Hour standby
- 1 Year warranty

ACCESSORIES

Flip Phone Batteries from	$29.95
Flip Phone Cig. Adapter	36.99
UltraClassic Batteries from	33.95
UltraClassic In-Car Charger	34.95

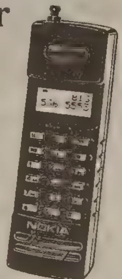
UltraClassic Portable

$CALL

- 100# Alpha memory
- 2 Batteries
- 2 Antennas
- 3 Year warranty

NOKIA

Portable Cellular Phone



THE RIGHT CHOICE...NO MATTER WHO YOU ARE.

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- 40 Number memory dial
- 14 Hour standby time
- 75 minute talk time

PT-612

Authorized
GTE Mobilnet
Sales Representative

- **Largest toll-free calling area**
- **Voice Mail**

Ask for more details.

*Service Activation Not Required

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High Quality without the High Price!

CM-1402

Multi-scanning Super VGA Monitor

- *1024x768 max. resolution*
  Maximum resolution at interlaced mode
- *Super Fine CRT*
  0.28mm dot pitch & non-glare CRT for greater clarity
- *Tilt-swivel base...*
  For comfortable viewing position!
- *Unlimited colors...*
  For photographic image!
- *Auto Synchronizing*
  Auto scanning of all horizontal & vertical frequencies

$299

Our V.32bis Scout is Trustworthy.

$269

Features:	Scout	ScoutPlus
CCITT V.32bis (14,400bps)		√
CCITT V.32 (9600bps)	√	√
CCITT V.22bis (2400bps)	√	√
CCITT Group 3 send/receive fax		√
CCITT V.42bis/MNP5	√	√
CCITT V.42/MNP2, 3 & 4	√	√
Internal half-card w/16550 UART	√	√
External	√	√
Data communications software	Qmodem	
Warranty	5Years	

$249

A Scout is trustworthy.
Digicom Systems proudly introduces the most trusting kind of high-speed modems, the Scout Series. Our Adaptive Rate feature ensures that each connection is at the fastest and most reliable speed.

Data throughput up to 57,000 bps.
Fully compliant with CCITT standards, the Scout and ScoutPlus features CCITT V.42bis, MNP5 data compression for data throughput up to 57,600 bps.

Bundled with Delrina's WinFax Lite and DosFax Lite software!

WYSIWYG Faxing.
The ScoutPlus combines V.32bis 14,400 bps data and send and receive CCITT Group 3 fax with Delrina's WinFax Lite and DOSFax Lite software. The Scout is fully V.32 compliant 9600 bps data modem.
The Scout Series includes supporting data software, an introductory CompuServe membership and a 5-year warranty.
Digicom Systems incorporates award-winning engineering, service and support in every product.

DSI

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MouseMan™

High Resolution Serial Mouse

LOGITECH

Don't be caught with a dying mouse!

- 400dpi resolution
- Three programmable button flexibility
- New ergonomic design
- Enhanced MouseWare™ Utilities
- Windows™ 3.0 compatible
- IBM PC, XT, AT, PS/1, PS/2 compatible

$59.95

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Digital Camera for DOS Systems

Fast and Easy to Operate! *Perfect for all your DTP needs!*

- Take up to 32 pictures from 3ft. to infinity
- Enhance photos w/FotoTouch™ Image Editing
- Save images in TIFF, ESP, PCX & BMP format
- Built-in auto flash for great indoor picture

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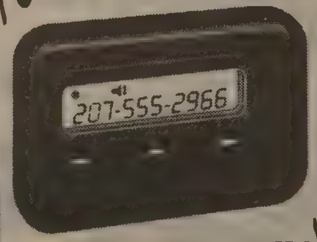
Now! You're always in touch!

GO WHERE YOU WANT!



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LIFESTYLE NUMERIC PAGER

DO WHAT YOU WANT!

- *NO ONE TURNED DOWN!*
- *INSTANT ACTIVATION 7 DAYS A WEEK!*
- *LARGE SERVICE COVERAGE AREA!*

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AND OFFICE BUSINESS CENTER!

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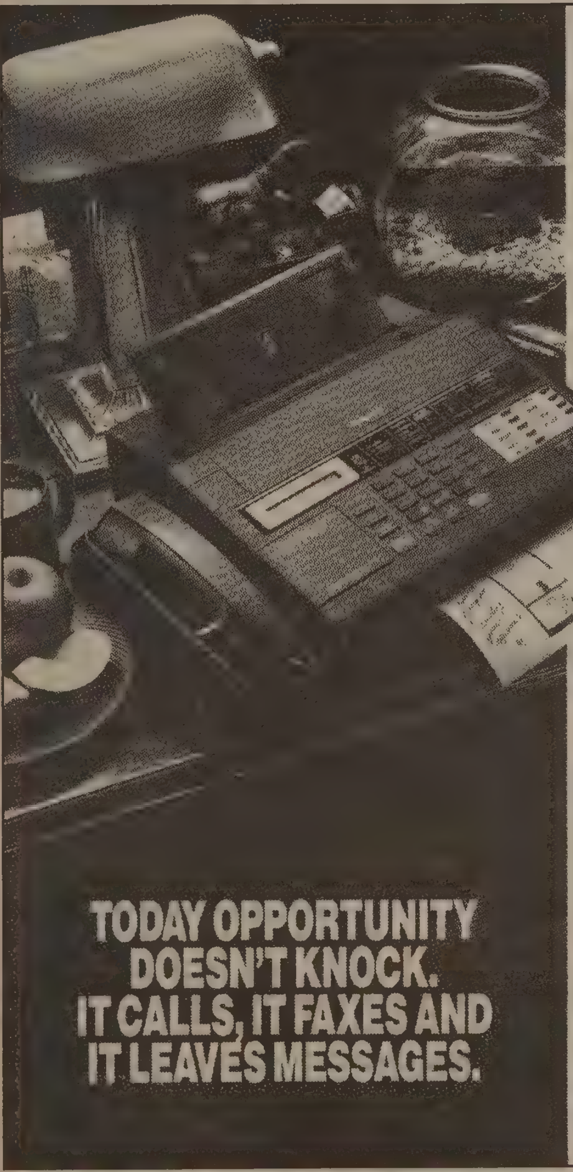


KX-F90

Panasonic introduces a complete communications center for the home office.

Every time you miss a call, miss a fax or miss a message, you may be missing an opportunity. That's why Panasonic introduces an automated communications center specially designhed for home offices and small businesses. The new Panasonic KX-F90. This sophisticated system knows when an incoming call is a phone call or a fax and automatically switches to the proper function. Which means it can handle all your calls, messages or faxes with just one phone line. With its automatic paper cutter and a 10-page document feeder, you don't have to stay in the room to send or receive faxes. And since it can produce 16 shades of grey, your faxes will have excellent reproduction of charts, graphs and photographs.

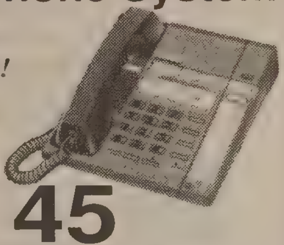
And its phone system and built-in answering machine has what every business person needs-Privacy Ring. It lets you know if a call is important before you answer it.

Today opportunity doesn't knock. And it can slip through your fingers if you don't get the new Panasonic KX-F90 communications center.

$499

3-Line Phone
Intergrated Telephone System
KX-T3170

Ideal for Small Businesses!
Why Pay for a PBX?



• Automatic line selection • 3-way conference • Auto dialing • Programmable line selection • Auto redial and save • Hands-free speakerphone • Dual-color CO line LEDs • External music jack • Switchable tone/pulse

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900MHz Pocket Wireless Phone

Perfect for Large Warehouses!
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• Signal goes thru concrete walls

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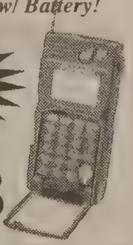

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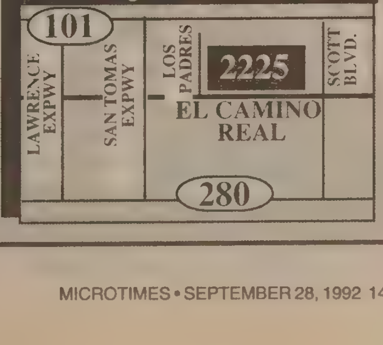

YOUR FIRST COMPUTER

About Fonts

Or, Why What You Got Wasn't What You Wanted

BY MIKE MARKOWITZ

In the beginning, all words were written by hand, and a proficient scribe was worth more in the slave market than several courtesans. Then they started automating the text business.

First they introduced carved wood blocks, so that one master image could stamp out multiple copies. Then Johann Gutenberg had the bright idea of making movable type out of metal, so one set of blocks could be rearranged to print any possible page. In the nineteenth century they came up with the typewriter, to eliminate all traces of individuality from business correspondence, and inflict the curse of carpal tunnel syndrome on future generations of keyboard drones.

In our own blighted lifetimes we have seen the dawn of the personal computer, and its faithful servant the desktop printer. Now the aspiring scribe can set down winged words in 24-point Garamond Condensed Light rotated 45 degrees, assuming the software is willing to recognize his printer, and assuming the printer is prepared to acknowledge the existence of 24-point Garamond Condensed Light.

When you work with computers, you learn from bitter experience to Never Assume Anything.

Screen displays and printing devices have evolved along separate paths, and the journey text must follow from keyboard to paper is almost as perilous and uncertain as its journey from brain to keyboard. The problem is this: The way computers display words on your screen and the way that printing devices put down text on paper are (usually) radically different.

KINDS OF FONTS

Sans Serif
Roman
Monospaced
Proportional
Bit-mapped
PostScript

6 point
9 point
10 point
12 point
14 point
18 point
24 point
48 point

Because of this mismatch, tons of paper travel every day from the printer output tray directly to the trash bin, because what you got wasn't what you wanted. The cost in time, frustration, and physiological consequences of suppressed rage are hard to estimate.

Consider what happens when you are using a word processor and you press a key—let's say a comma. The computer displays the comma on the screen at the current cursor position. At the same time, the computer attaches the byte (eight digital bits) that represents a comma (00101101) to the end of the current file in memory.

If I'm using a plain old word processor on a plain old PC-compatible, the computer's video card only knows one way to display a comma, so that's what I'll see on the screen. Let's say I want to print the file on the Epson dot matrix printer over in the corner. The printer knows three ways to make a comma—it has three built-in fonts called Draft, Roman and Sans Serif. If I don't push any buttons, I'll get Roman, which is the default. If my word processor has the proper Epson printer driver, and I remember how to put in the right codes or commands, then I can use any of the printer's built-in fonts. The results will not necessarily resemble what I see on the screen.

If I'm using a fancy Windows or Macintosh word processor on a computer connected to a laser printer, things rapidly get more complicated. The printer may have a couple of dozen built-in fonts—it comes from the factory knowing thirty-five different ways to print a comma. Your computer may or may not be able to use all those fonts, depending on how your software was set up when you (or the guy at the computer store) installed it. In addition, you may have any number of "soft" or "downloadable" fonts lurking in your computer. These are files of font information that are transmitted (or "downloaded") to the printer when they are needed.

A DIGRESSION ABOUT BITS

Originally, computers needed only seven digital bits to specify a character. Seven bits gets you 128 possible characters, which is quite sufficient for all the letters of the alphabet, digits, punctuation marks and special control characters. The eighth or "high" bit was left undefined. IBM's Extended Character Set uses the extra bit to add "graphic" characters that let you draw lines and boxes with text. Macintosh fonts use the extra bit to specify all the accented special characters and symbols needed for various foreign languages. It's just another little annoying incompatibility that makes it difficult to share fonts across the chasm that divides the Mac and PC worlds...

WHAT IS A FONT?

When printers and typographers talk about fonts they mean a specific set of characters in a single size and style. Computer people have gotten in the habit of using "font" to describe an entire family of related sizes and styles (which printers often call a typeface). In the non-metric world, type sizes are usually measured in "points," where 72 points equals one inch. Styles are variations on basic letterforms, such as bold, italic, and underlined. Inexperienced users often tend to mix too many fonts and styles recklessly on the same page, creating a document that looks like a ransom note.

KINDS OF FONTS

Consider the Macintosh, which handles the screen as a big picture, made up of various little pictures (a "graphic user interface," as contrasted with the standard text-based PC screen of twenty-five lines; each line having eighty characters). Originally, there was only one kind of Macintosh font, which consisted of "bit-mapped" characters in various sizes. The screen displayed the characters at 72 dots per inch, and Apple's dot-matrix ImageWriter printed them out at 72 dots per inch. This is the ideal font architecture—the screen display and the printing device share the same "imaging model."

Mac fonts had cute city names (Chicago, Monaco, Geneva, New York) and every Mac had the same basic set, so if you sent a document on disk to your friends, they could see it exactly the way you wrote it. The major drawback of bitmapped fonts is that they require a separate set of little pictures for every size and style.

This rapidly eats up disk space. For really big letters or in-between sizes, the computer had to use simple geometrical scaling, which often produced jagged, misshapen letters of startling ugliness.

Around 1986, high-resolution laser printers became affordable for affluent computer users, and the font business started getting com-

Continued on page 264

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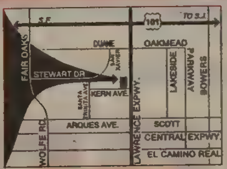

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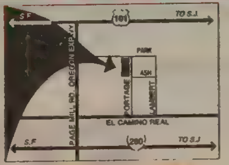

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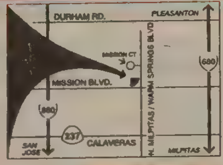

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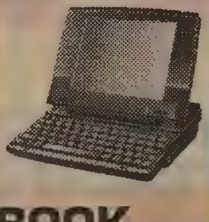

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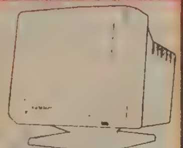

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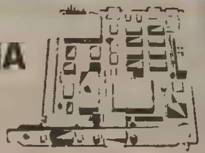

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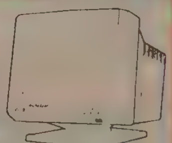

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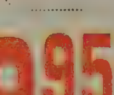

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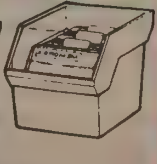

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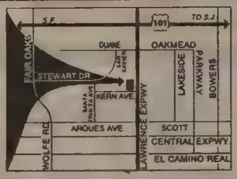
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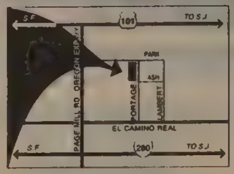
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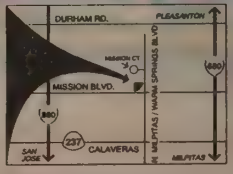
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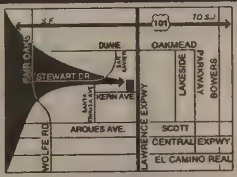

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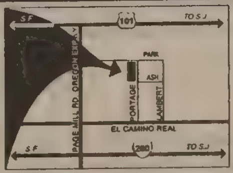

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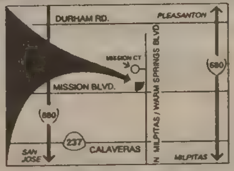

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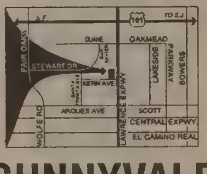
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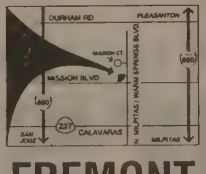
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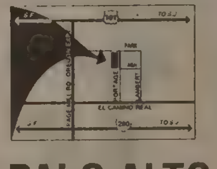
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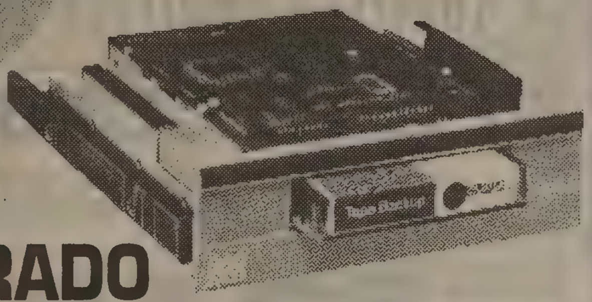

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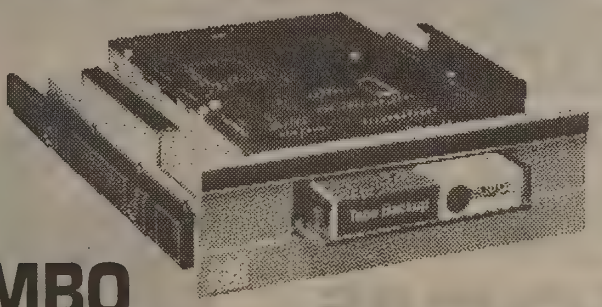

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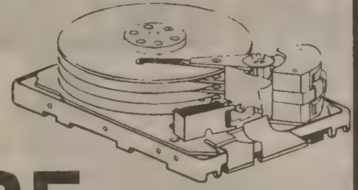

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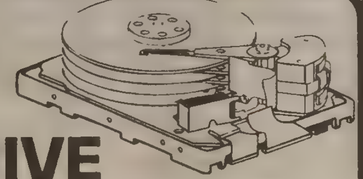

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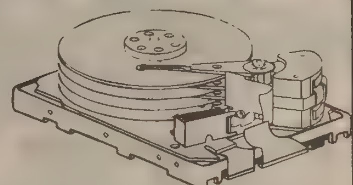

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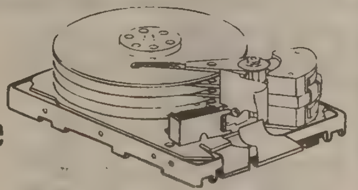

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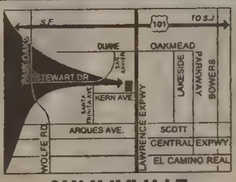
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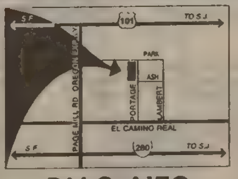
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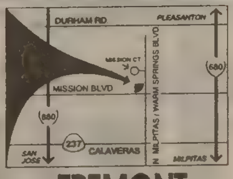
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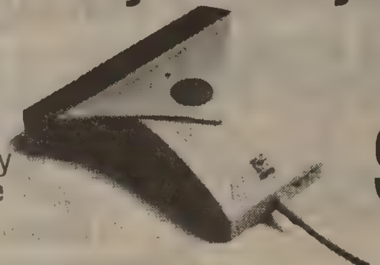

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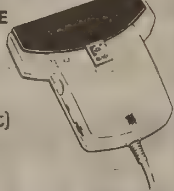

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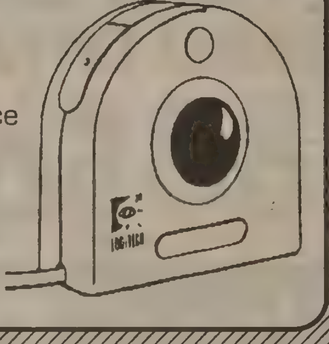

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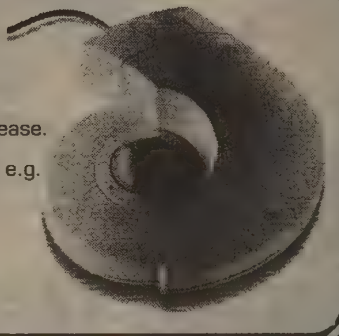

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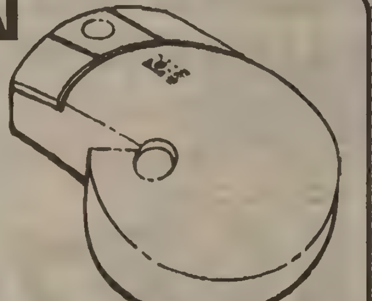

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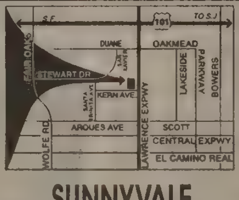
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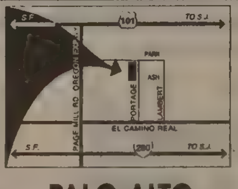
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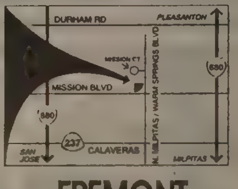
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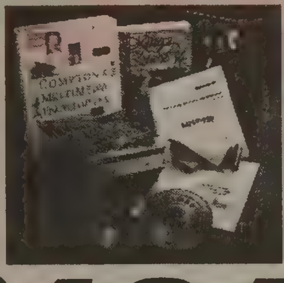

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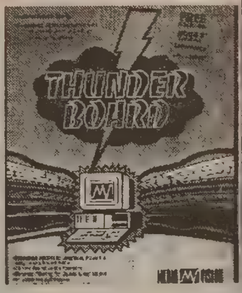
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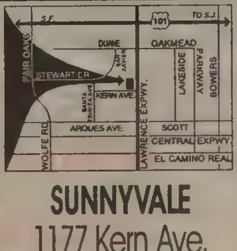
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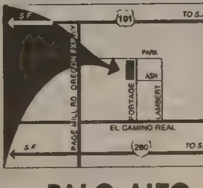
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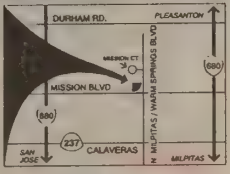
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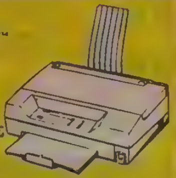

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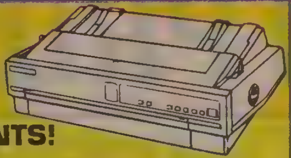

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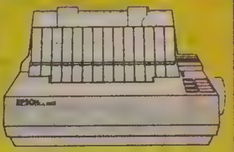

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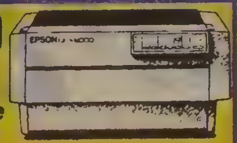

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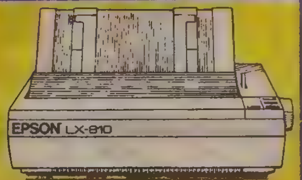
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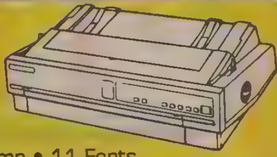

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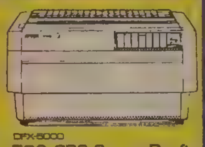

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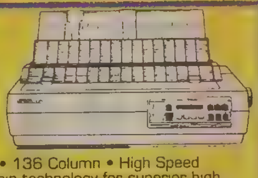

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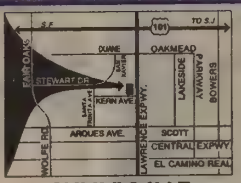
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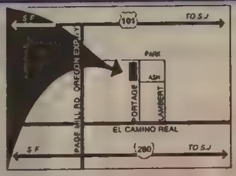
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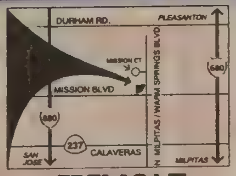
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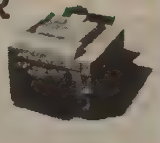

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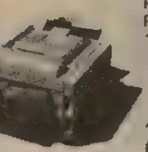

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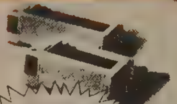

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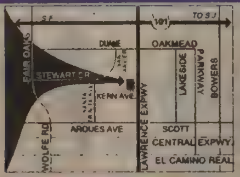

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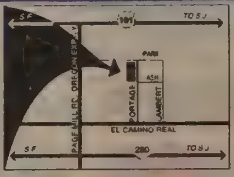

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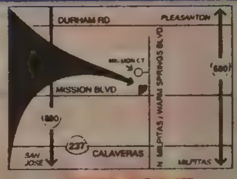

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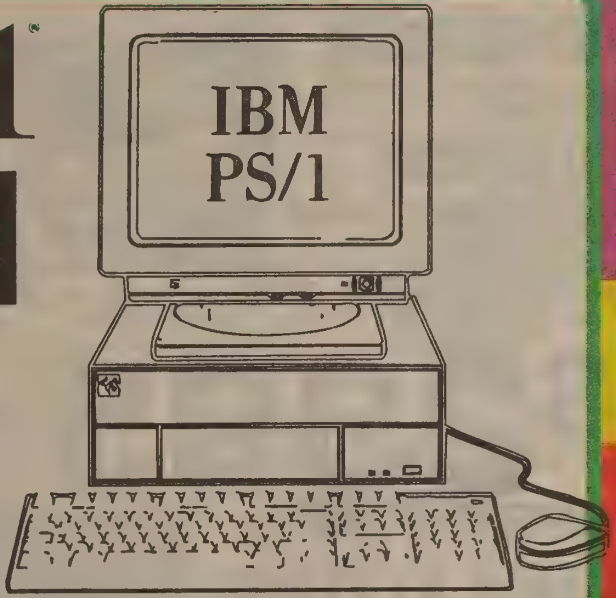

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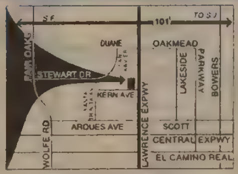
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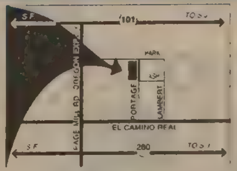
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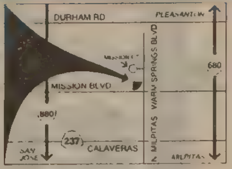
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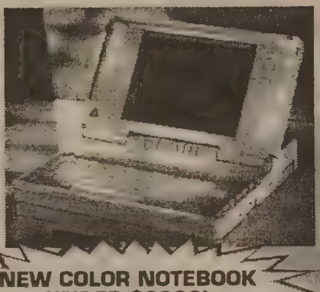

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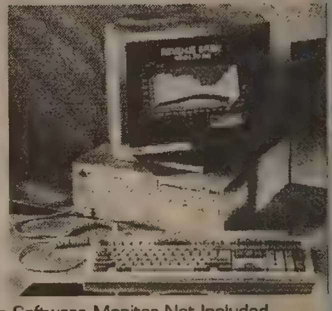

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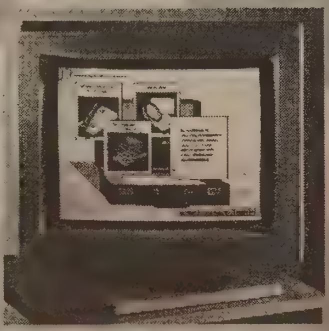

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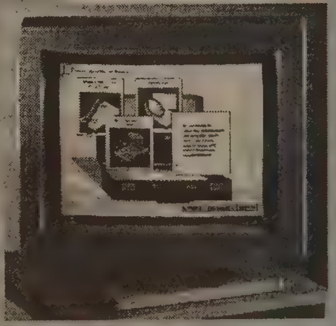

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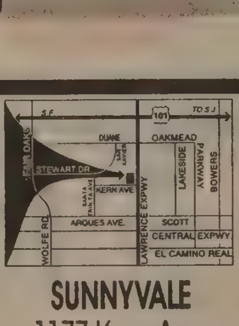
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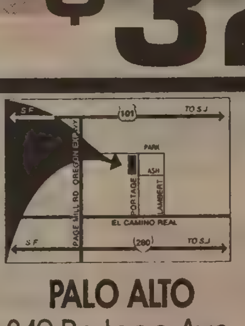
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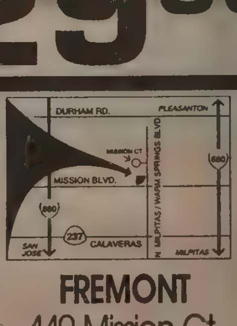
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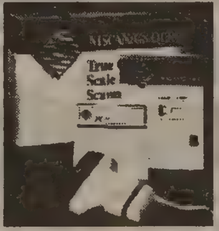

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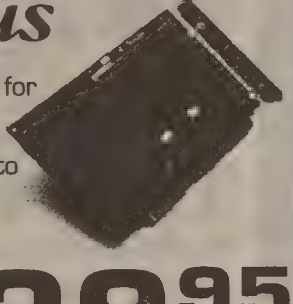

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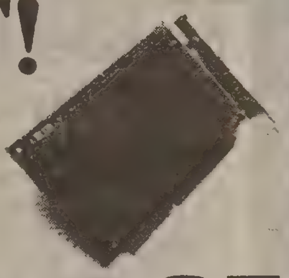

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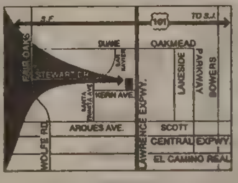
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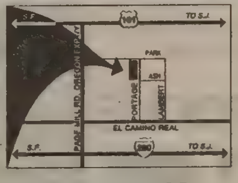
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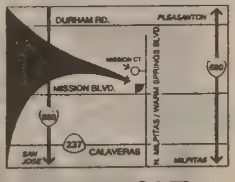
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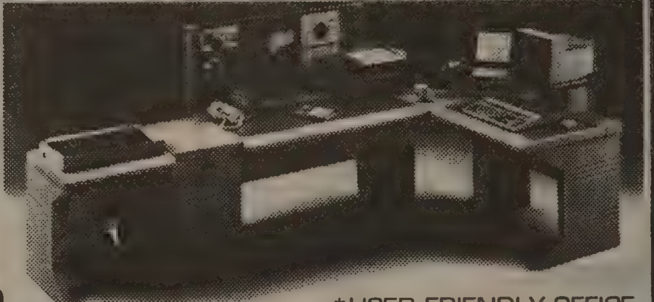

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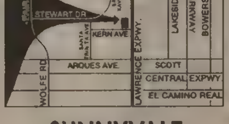
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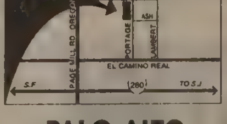
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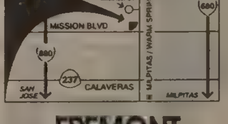
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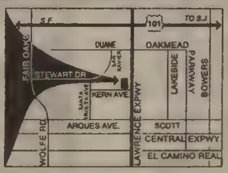
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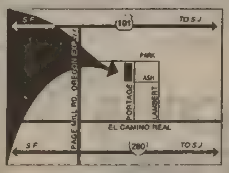
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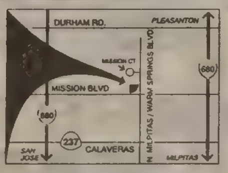
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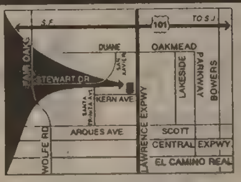
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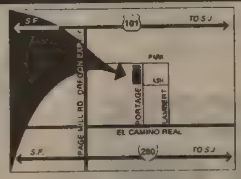
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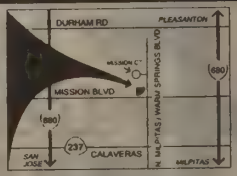
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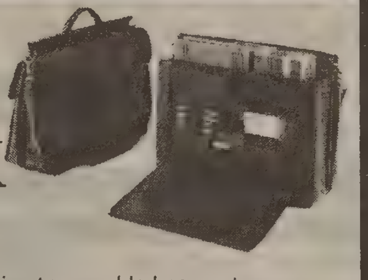

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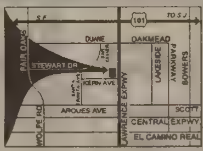
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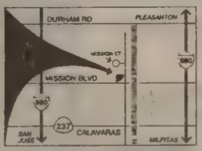
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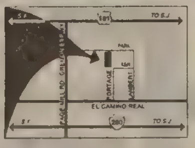
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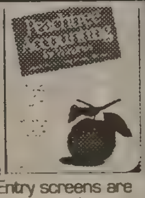
SUPER SOFTWARE DEALS AT FRY'S!

Peachtree Accounting for Windows



You'll love the efficiency and convenience of Peachtree Accounting for Windows. Entry screens are designed to look like the forms they represent, and you can choose program options quickly from the command bar at the top of your screen.

Peachtree

$75 99

IBM
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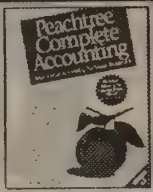
Peachtree Complete Accounting 6.0



Peachtree Complete Accounting is the perfect accounting system for any growing business. Selected as the most highly recommended accountng package in recent surveys by Accounting Today. It offers an unlimited number of companies, customers, vendors, assets, employees, inventory items and G/L accounts.

$189 88

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THE NORTON DESKTOP

FOR DOS

EASY, VISUAL ACCESS TO YOUR DOS FILES AND PROGRAMS!

Norton Desktop for DOS is the industry's first "drag and drop" desktop utility for DOS-based PCs. It combines an easy-to-use visual interface for DOS with an array of non-technical tools that make computing much easier for the everyday user. It safeguards your PC with data back-up, virus protection, file recovery, and hard disk optimization

SYMANTEC.

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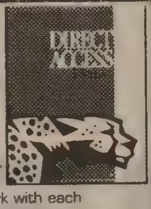
DIRECT ACCESS Windows



Automatically searches your disk and organizes your program icons into simple and intuitive menus. Eliminates the graphical confusion of Program Manager Start your favorite programs at the click of a mouse, or the stroke of a key Create your own custom menus, with your own unique names. Includes Usage Tracking, to track how much time you work with each application- perfect for people who bill their time.

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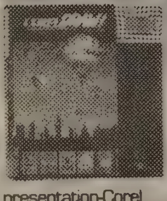
COREL DRAW 3.0



Whether you need a headline, newsletter or an invitation for a birthday party, a diagram for a technical manual or a new logo for a presentation-Corel Draw will help you add impact, interest and flair!

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Adobe Systems Incorporated

ADOBE *TYPE SET* VALUE PACK

The Adobe Type Set Value Pack gives Windows and OS/2 users 30 popular, scalable typefaces plus award-winning Adobe Type Manager software, all for an economical price. This high-quality type also works with other fonts such as True Type and with any screen and printer.

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Keeps tabs on every aspect of your personal business. It has all the financial tools you'll ever need under one roof. Tools for your banking, checking, taxes, insurance, retirement and portfolio management demands in one easy to use, fully integrated package.

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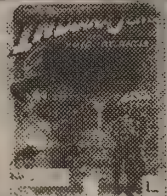
INDIANA JONES AND THE FATE OF ATLANTIS



In this newest adventure game, you will play the role of Indiana Jones. You are going to help Indy search for the fabled city of Atlantis. It requires 256 color graphics and supports most known sound boards.

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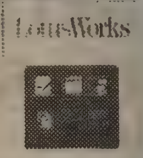
LotusWorks 3.0



LotusWorks is the simple-to-use and learn software that you need to run your small business. It comes with the six most important business tools: word processing with spell checker and thesaurus, database management, spreadsheet, graphics and communication.

$89 95

Lotus

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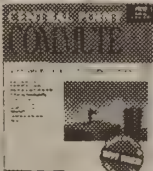
Central Point Software Incorporated

CENTRAL POINT COMMUTE



It's the program that lets you access your office PC or LAN from anywhere, anytime. You can retrieve files, look up information, check your E-mail and much more.

$34 95

IBM
#1621501

PARADOX 4.0 FOR DOS

Paradox 4.0 brings you new power and connectivity for the most complex database management needs. It is the ideal solution to your corporate networking needs. It can share data with other Borland products. It is also compatible with a variety of SQL servers and SQL dialects.

BORLAND

$559

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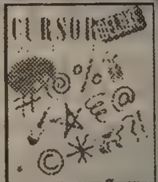
CURSOR DELUXE



Now you can customize your own large, small, even animated cursors -firing rocket ships, huge arrows, even a dog wagging its tail! Plus, select new wait signals (replace the standard Windows hourglass with a working stoplight), I-beams (with Gothic accents) and window re-size tools (finally make them big enough to see). With included Cursor Designer™, you can make your own custom-perfect cursors for presentations, LCD screens, and just for fun.

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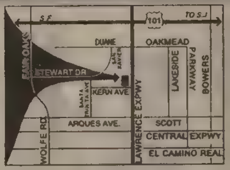

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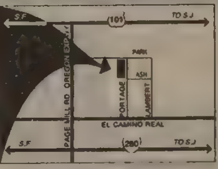

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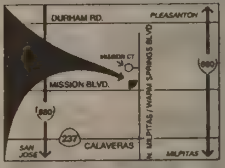

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FLUKE 97 SCOPEMETER™

Hand-held instrument that teams a 50MHz 25 mega-samples per second, dual channel digital storage oscilloscope with a feature-packed 3000-count digital multimeter. All in a rugged, sealed industrial package with battery operation that you can take anywhere you go.

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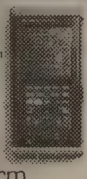

50MHz Scope & Multimeter
LED Display Waveform Memories and Average Min/Max Mode, Plus More.

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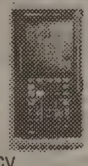
FLUKE 93 SCOPEMETER™



50MHz Scope & Multimeter
LED Display Frequency
True RMS Volts
Smoothing, Change Alert, Touch Hold, Plus More.

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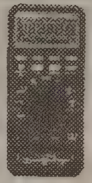
FLUKE 88 DIGITAL MULTIMETER



4000 count DMM designed for the automotive market.
LO-Ohms, Smoothing, RPM, Duty Cycle w/Dwell Chart.

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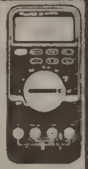

0.1% Basic dc Accuracy
20kHz acV
High Resolution Analog Pointer
True RMS ac
1ms PEAK MIN MAX
4 1/2 Digit Mode • Back Lit Display
Three Year Warranty
Volts, OHMS, Diode Test, Audible Continuity, Frequency and Duty Cycle Capacitance, Touch Hold, Relative Protection Modes, Holster With Flex Stand

$298.99

#1440238

FLUKE 85 DIGITAL MULTIMETER

0.1% Basic dc Accuracy
20kHz acV
Analog bar graph & zoom
Three year warranty

VOLTS, OHMS, DIODE TEST, AUDIBLE CONTINUITY, FREQUENCY AND DUTY CYCLE CAPACITANCE, TOUCH HOLD, RELATIVE PROTECTION MODES, HOLSTER WITH FLEX STAND

$254.99

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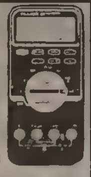
FLUKE 83 DIGITAL MULTIMETER



0.3% Basic Accuracy
5kHz acV
Analog bar graph & zoom
Three year warranty

VOLTS, OHMS, DIODE TEST, AUDIBLE CONTINUITY, FREQUENCY AND DUTY CYCLE CAPACITANCE, TOUCH HOLD, RELATIVE PROTECTION MODES, HOLSTER WITH FLEX STAND

$214.99

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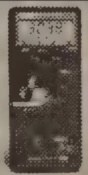
FLUKE 77 SERIES II DIGITAL MULTIMETER



3200 COUNT DIGITAL DISPLAY
31 SEGMENT ANALOG BAR GRAPH
0.3% BASIC DC VOLTS ACCURACY
2.0% BASIC AC VOLTS ACCURACY
1.5% BASIC DC VOLTS CURRENT ACCURACY (32mA TO 10A)
0.5% BASIC RESISTANCE ACCURACY • HOLSTER/FLEX-STAND
2000 HOUR BATTERY LIFE (ALKALINE
AUTOMATIC TOUCH HOLD • DIODE TEST
AUDIBLE CONTINUITY BEEPER • AUTORANGING WITH MANUAL RANGING • SLEEP MODE WITH HARD POINTS
3 YEAR WARRANTY

$164.99

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FLUKE 75 SERIES II DIGITAL MULTIMETER

3200 COUNT DIGITAL DISPLAY
31 SEGMENT ANALOG BAR GRAPH
0.5% BASIC DC VOLTS ACCURACY
2.0% BASIC AC VOLTS ACCURACY
1.5% BASIC DC VOLTS CURRENT ACCURACY (32mA TO 10A
0.7% BASIC RESISTANCE ACCURACY • HOLSTER/FLEX-STAND
2000 HOUR BATTERY LIFE (ALKALINE) • DIODE TEST
TL70 TEST LEADS • AUDIBLE CONTINUITY
BEEPER AUTORANGING WITH MANUAL RANGING
SLEEP MODE • 3 YEAR WARRANTY

$138.99

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FLUKE 73 SERIES II DIGITAL MULTIMETER

3200 COUNT DIGITAL DISPLAY
31 SEGMENT ANALOG BAR GRAPH
[illegible] BASIC DC VOLTS ACCURACY
[illegible] BASIC AC VOLTS ACCURACY
[illegible] BASIC DC VOLTS CURRENT ACCURACY (32mA TO 10A
[illegible] BASIC RESISTANCE ACCURACY • HOLSTER/FLEX-STAND
2000 HOUR BATTERY LIFE (ALKALINE • DIODE TEST
TL70 TEST LEADS AUDIBLE CONTINUITY BEEPER
AUTORANGING WITH MANUAL RANGING
SLEEP MODE • 3 YEAR WARRANTY

$98.99

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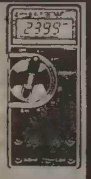
FLUKE 70 SERIES II DIGITAL MULTIMETER



DC VOLTS - 5 basic DC accuracy
AC VOLTS - .2% accuracy from 45Hz to1KHz Ohms • Diode Test
Touch Hold Continuity Beeper
Sleep Mode Improved TL 75 • Test Leads
200Hc Battery Life • Three Year Warranty

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Min Max recording with relative time stamp
Capacitance: .001 to 9999uF
V Check™ • Continuity Capture™
4000 count digital display
0.9% basic dc volts accuracy
1.9% basic ac volts accuracy
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Fast continuity beeper • Diode Test • Sleep mode
Two year warranty

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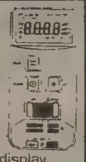

Capacitance: .001 to 9999uF
V Check™ • 4000 count digital display
0.9% basic dc volts accuracy
1.9% basic ac volts accuracy
0.9% basic ohms accuracy
Fast continuity beeper • Diode Test
Sleep mode • Two year warranty

$79.95

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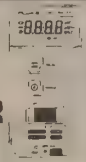
FLUKE 10 HANDHELD DIGITAL MULTIMETER



4000 count digital display
1.5% basic dc volts accuracy
2.9% basic ac volts accuracy
1.5% basic ohms accuracy
Fast continuity beeper • Diode Test
Sleep mode • Two year warranty

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True RMS AC Clamp Meter.
Analog Digital display.
Frequency, Autorange, Hold Self Test, Min/Max, Smooth

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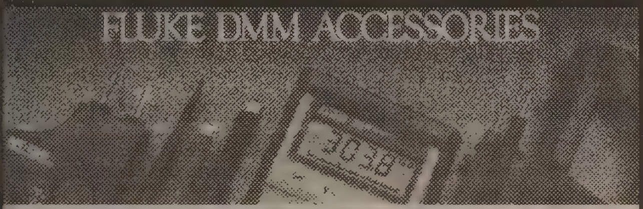

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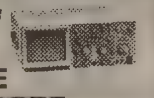

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20MHZ Response at a true 3DB
AUTO/NORM triggered sweep operation with AC TVH TVV and the coupling • x10 magnifier
Bright, sharp rectangular CRT with P3331 phosphor
X-Y operation • Front panel trace rotation control
Tilt stand and soft handle • Selectable +/slope +
Built in calibration source • Compact low profile design

$379

BK-2120
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BK PRECISION
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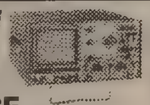
40 MHz DUAL-TRACE OSCILLOSCOPE



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20 calibrated sweeps
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x10 sweep magnification • Single sweep
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Channel 1 output

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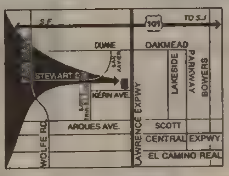

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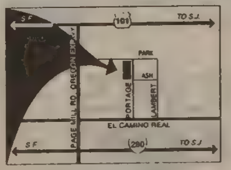

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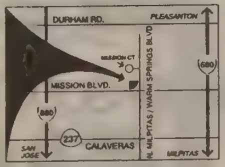

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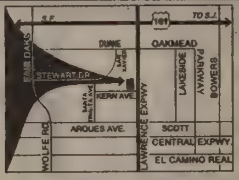

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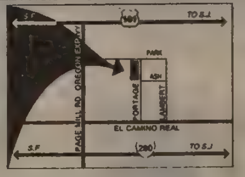

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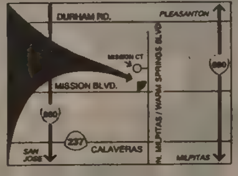

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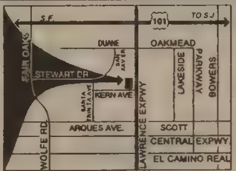

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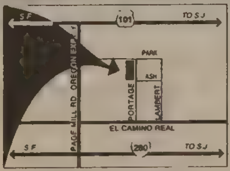

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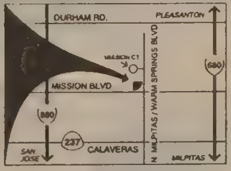

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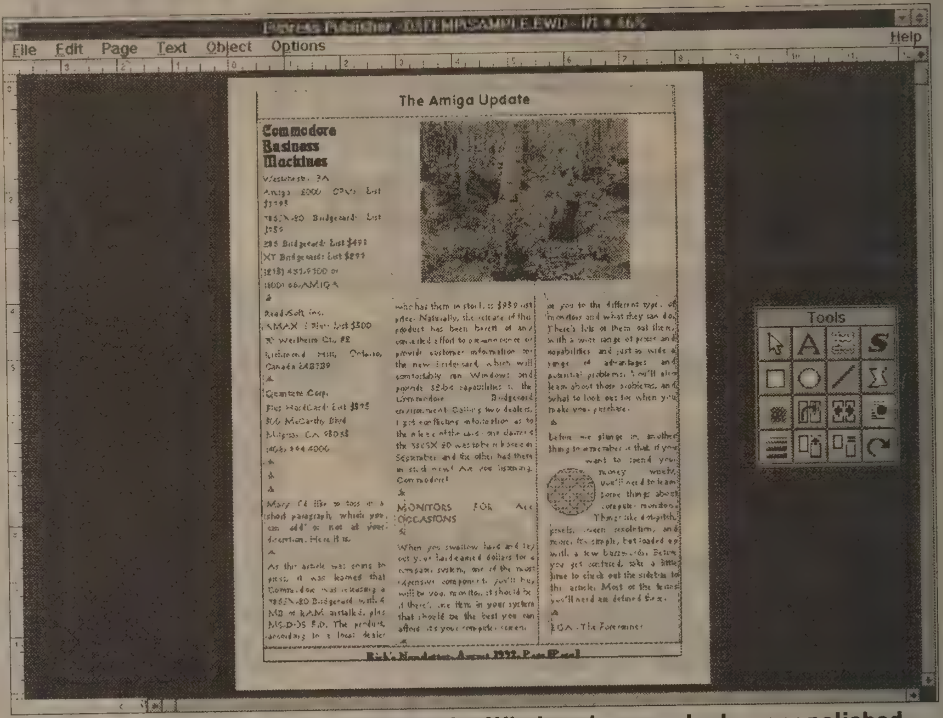
Low-End Desktop Publishing For Windows

New Options For Low-End Desktop Publishing, Thanks To The Runaway Success Of Windows.

BY RICH GRACE

There are new options for low-end desktop publishing on a PC, thanks to the runaway success of Windows. While expensive programs, such as PageMaker, Ventura Publisher, and Framemaker, offer the professional the features they require, the home or small business user who designs smaller promotional leaflets or an occasional newsletter probably won't use all of this desktop design power—even after they invest the time to learn these programs. With more low-end, less expensive Windows DTP programs on their way, here is a look at three of the newer entries: Microsoft Publisher, PFS: Publisher for Windows, and Express Publisher for Windows.

All three of these programs have a set of common characteristics: they all make use of Windows capabilities such as TrueType and Adobe Type Manager, resizeable windows, varying screen resolutions, and, in most cases, importing of Windows word processor files. They also employ visible column guides, which are visual aids to creating text columns of uniform size.



Overall, a layout on Express Publisher for Windows' screen looks very polished.

MICROSOFT PUBLISHER

Microsoft Publisher is, of course, brought to you by the same company that gives you Windows. It's a $199 program which, while not as powerful or feature-laden as its more expensive brethren, shows a clean design with good attention to detail and offers some innovative wrinkles.

The first thing you notice about Publisher is its use of an automated page-setting feature called Page Wizards. This allow you to design a leaflet, newsletter, and other documents using templates built into the program. It's fast and very easy, taking around ten steps, all of which are done with a mouse click, in response to questions asked by the program. It is an interesting and innovative feature that the casual user will greatly appreciate.

The actual mechanics of the program are simple and well done. All the basic functions are there: kerning, line spacing, multiple page views, multiple columns, importing of several standard picture formats, and more. The program offers a fairly large library of clip art, and a nice selection of headline fonts which are brought up in a separate menu.

Another nice feature of the program is its automatic flowing of text around graphics, regardless of their size. It's quick and saves time-consuming steps forced upon you by other programs. Since everything done in MS Publisher is based on frames, which you draw and place text and graphics in, it's easy to add captions, headlines, and pictures of any size to a page.

A long icon bar runs across the top of the MS Publisher window giving users quick access to many features. The program runs very cleanly and has above average speed for a Windows DTP program. The program does scroll graphics on a page a bit slowly (but try to find something that doesn't!). Microsoft has also done a good job with the *User's Guide.* It's well written, generously illustrated, and contains substantial tutorials which will give you a strong command of the program in a couple of hours. Microsoft also publishes books to supplement the information in the user's manual.

Overall, MS Publisher is a stable, straight-

The Windows version Express Publisher bears very little resemblance to its predecessor and is more difficult to use. Fortunately, Express Publisher for Windows does offer a decent range of features and far outstrips its DOS cousin.

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Rich Grace is a Contributing Editor to PC Home Journal, and a contributor to Computer Buying World. He's a technical writer, and an enthusiastic user of PC, Mac, and Amiga platforms. He lives in Orange County. He can be reached on MCI Mail ID 484-6217.

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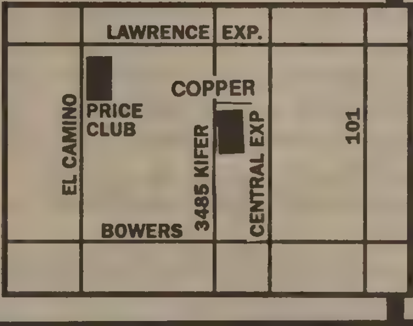

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PFS: PUBLISHER FOR WINDOWS

PFS: Publisher for Windows, from Spinnaker Software, is a newcomer to the increasingly crowded field of budget DTP software and bids to be the most feature-rich program in its class.

Reading the list of features on the box shows a program that far outstrips the low-end competition. It includes OLE (Object Linking and Editing) support, a thesaurus and spell checker, column guides, importing of text from DOS and Windows word processors, support for TrueType and Adobe Type Manager, a moveable toolbox which can be reshaped on the screen, icon toolbars resembling those found in Microsoft Word for Windows, and quite a bit more. Kerning, line spacing, drop caps, and a small library of clip art (most of which is of fairly poor quality) are other offered features. The program provides screen zooms of up to 400%. The manuals are generous, readable, and well-organized, with a fairly complete index. PFS also comes with lifetime free support.

The resizeable tool box is a nice idea. Also, as the mouse passes over each tool, a message appears at the bottom of the window describing the tool's function. It's a convenient, well-implemented feature which will save you time searching through the manuals. Most features of the program are easy to access and to use. In fact, before I started seriously working with the program, PFS gave a very good first impression.

Unfortunately, that did not last. On a 386/40 system (with plenty of RAM, no complicated memory management stuff, a Diamond Stealth video accelerator, and After Dark disabled), PFS crawls. The first version of the program I reviewed, version 1.0, took almost thirty seconds to load a single-page newsletter file. When modifying a single column on the newsletter, twenty eight seconds elapsed before the text was fully redrawn on the screen. Minor actions, such as Send-to-Back or Bring-to-Front, took many seconds to execute.

OLE server-client routines function unevenly at best. For example, when attempting to do a basic Paste Special from the clipboard of Word for Windows text, the only thing to appear on the PFS page was the Word logo!

PFS also crashes in many basic operations, such as performing basic character spacing functions or using Drop Caps. Some features I attempted to use only had the crash or Application Reboots to show for it. Calling the tech support number on several occasions only got me a busy signal. That's a shame, because I wanted to give PFS as much of a chance as possible.

Program ergonomics are also imperfect. If PFS runs in a resizeable program window, you can't easily reach the scroll bars and other gadgets of the document window (most Windows programs resize their document windows to compensate for a shrunken program window, but PFS doesn't). PFS also lacks a basic Undo feature, which is vitally important in desktop publishing. I would have skipped the thesaurus and spell check (which are features you really should be using in your word processor anyway) to get an Undo in this program.

PFS's user interface and methods are logical enough and many of its features offer a great value. Unfortunately, even with an interim bug fix I've received (version 1.01, which repaired some of the screen redraw problems and the glacially slow file loading), PFS: Publisher for Windows is still crash-ridden. I sincerely hope a major software update fixes the problems, because the program conveys a powerful first impression.

EXPRESS PUBLISHER FOR WINDOWS

I've looked forward to reviewing Express Publisher for Windows. In previous articles for other magazines, I've reviewed three other programs from Power-Up Software, including the longtime DOS program Express Publisher. I wasn't crazy about the original Express Publisher for DOS, because of its crude typefaces and its limited clip art selection, but the program's methods were bare-bones and straightforward, and the program was fast.

The Windows version of the program bears very little resemblance to its predecessor and is more difficult to use. Fortunately, Express Publisher for Windows does offer a decent range of features and far outstrips its DOS cousin. It's much more flexible in its handling of type (conforming to all the standards set by other Windows programs), allows the "snapping" of elements in a document to a column guide or to measurements on the ruler, and gives you a nice proportional sizing routine for graphics objects in your layout. By specifying a percentage by which to shrink or expand the graphic, you can tightly control the size of a picture. The program also has the best Zoom feature in its class, going far beyond the usual 400% maximum magnification. Another good feature is irregular word wraps—the practice of wrapping text around the outline of an irregular shape, rather than the standard square text wrap. The program does this automatically, which is very slick.

The Master Page feature of Express Publisher for Windows makes creation of a document much easier. Master Pages allow you to create a uniform format over all pages of a document, such as having three columns for all the pages in a newsletter. You can place automatic page numbering, borders, and headers and footers in a master page. Overall, a layout on Express Publisher for Windows' screen can look fairly polished.

Alas, there are substantial problems with Express Publisher for Windows. One of the program's primary weaknesses is its surprising lack of support for Windows word processors. None are supported: not Word for Windows, nor Ami Pro, Word Perfect for Windows, Legacy, or any of the others.

Another problem is the program's speed. Sharing this attribute with PFS: Publisher, screen updates are very slow, and cause an annoying flicker of the screen for each redraw. Only one line of text can be scrolled at a time, and there is no autoscrolling (the practice of moving across the page with the cursor when moving an object to the edge of the screen). That really hurts. Using the traditional Windows scrolling gadgets on the sides of the window doesn't speed things up. Nor is there any provision for selecting all objects on a page (except with tedious mouse clicks), or for a Group command.

Saving files is fairly slow, even with a fast hard drive. All this being said, the program never hung or forced any application reboots, and seemed fairly stable in all operations—just darn slow! I can't imagine how much slower proceedings would have been without a Diamond Stealth card, which is rated as one of the fastest Windows accelerators around.

Express Publisher for Windows isn't a bad program at all. It certainly did the jobs I set out to do with it. With every program in its class, there are bound to be tradeoffs to maintain a reasonable price point, but why does one of the biggest ones have to be speed?

CLEARING THE FIELD

As a group of programs with roughly the same price point, and the same mission, we've definitely got a mixed bag. It's difficult for a software publishing house to create a product that stands out in a crowded field, and both EPWin and PFS: Publisher fall victim to Microsoft Publisher in terms of sheer functionality and ease of use. Microsoft's relatively early entry into the low-end desktop-publishing derby, combined with the rock-hard stability of their code, make this program the runaway winner in its category. ■

RESOURCES:

Microsoft Publisher, $175
Microsoft Corp.
1 Microsoft Way
Redmond, WA 98052

PFS: Publisher for Windows, $195
Spinnaker Software Corp.
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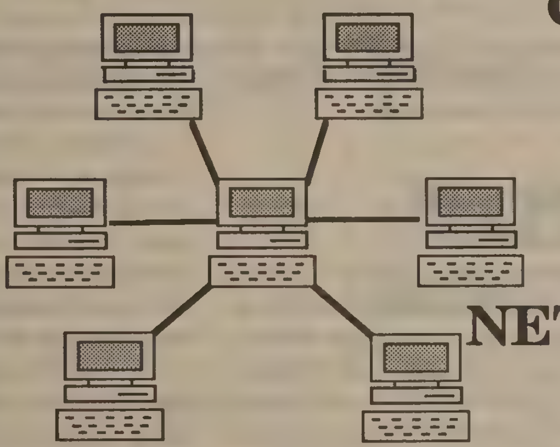

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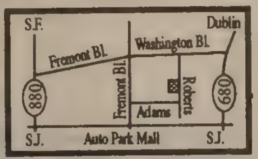

VR 101

Two Ways To Try Out Virtual Reality

BY BIRRELL WALSH

Attention, system administrators, industry forecasters, and artists!

You need to know about VR.

With all the talk about virtual reality, the canny user is caught in a dilemma. It seems that VR would be important to know about. It might be a new way to organize information and tasks. It might be the interface of the future. It is certainly a new medium for artists. It is worth investigating, certainly.

It also seems a little steep to run out and spend several thousand dollars for a full-scale system with glove and goggles. Is there any way to try out a simpler system and see if VR is promising?

You bet. We have discovered not one but two ways you can explore virtual worlds without mortgaging the ranch.

Virtual Reality Studio, by Domark, lets you create simple 3-D graphic worlds that you can automate and interact with.

"MUSEs," available by telnet through Internet-capable UNIX systems like The WELL, let you explore and extend complicated character-based worlds.

WHY PEOPLE LOVE VIRTUAL REALITY

Among the useful things the Behaviorist psychologists discovered is that people like doing what they're used to. They gave the idea a name: Premack's Principle. And Premack's Principle explains why people love Virtual Reality. VR imitates the reality that we are used to dealing with every day.

We have several billion years of evolution favoring easy movement in a three-dimensional, interactive world. We have a lot of skills all ready to go. While other computer interfaces demand that we learn new things, VR interfaces make use of the skills we already use daily.

The choice between graphic- and text-based virtual interfaces may be determined by practicalities or by preference, but both share the advantage that we just intuitively know what to do when confronted with them. For users, that means ease of use, and quick learning. For system administrators, it means reduced training and help-desk costs. For everybody, it can mean that the computer gives you more usefulness and pleasure.

For artists, it offers a chance to create startling statements and raw beauty. The virtual artist, like the architect, creates an entire environment. Unlike the architect, the virtual artist is not constrained by the laws of time, space or physics. Virtual artists are as rare today as the computer graphics specialist was ten years ago. In another decade, they will be everywhere.

While virtual worlds are easy to use, creating them can be a complex process. If we want to incorporate VR into a system, we need to know the effort involved.

Thus it behooves us to take a look into the virtual worlds that are available right now.

DOMARK'S VIRTUAL REALITY STUDIO

A number of games have been built using the Domark VR system. I happened to buy one—"Space Station Oblivion," a simple graphic world in which you could move and act. When I heard that the authoring system was available, I had to try it out.

When you use Virtual Reality Studio, you're able to interact with the objects on your screen. But this is more than just another three-dimensional video game. You are also the creator, making the objects in the world and deciding how they will behave.

The three-dimensional objects in the Domark world are variants of the cube and its pointy-headed cousin, the pyramid. You can stretch them and reshape them, or glue a number of them together to make more complex objects. There are no curvilinear objects at all. It is strictly a BlockWorld. This is not Lucasfilm.

The good news is that you can build remarkably complex worlds with these rectilinear elements. Walls, houses, hills, valleys, and oceans all can be fashioned from the basic shapes.

When you first load Virtual Reality Studio, you find yourself looking at a blank horizon beyond an abstruse instrument panel. These instruments allow you to move your point of view, create new objects, reshape them, color them, glue them together, group, and move them in three dimensions. You can build com-

Continued on page 266

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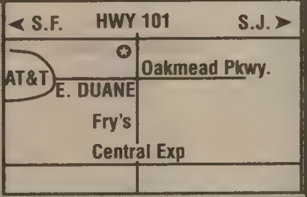

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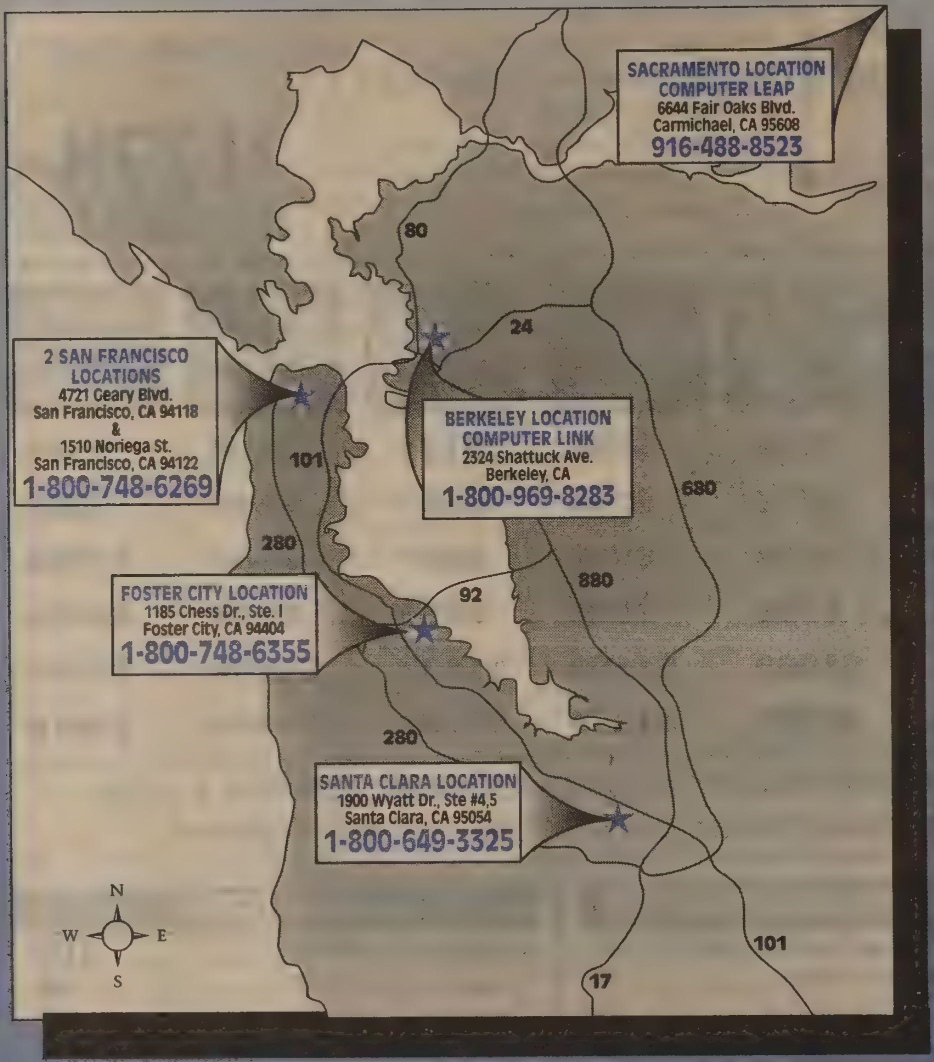
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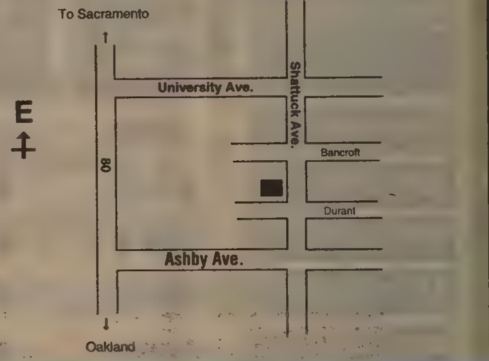
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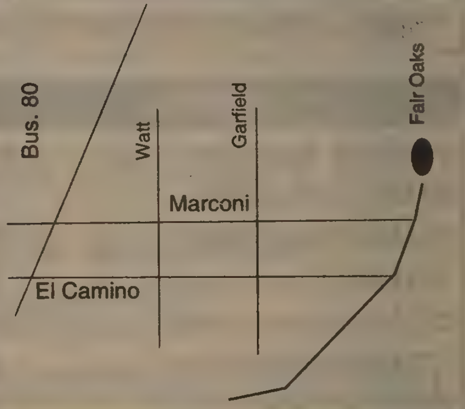
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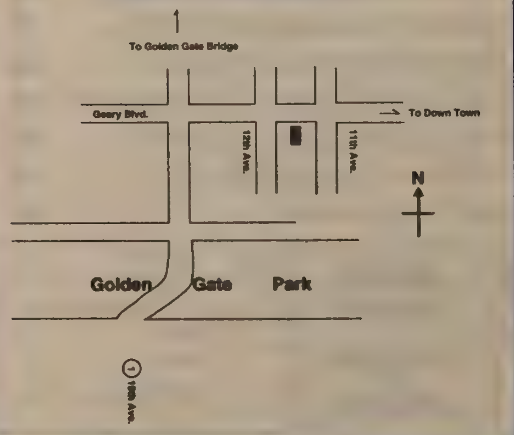
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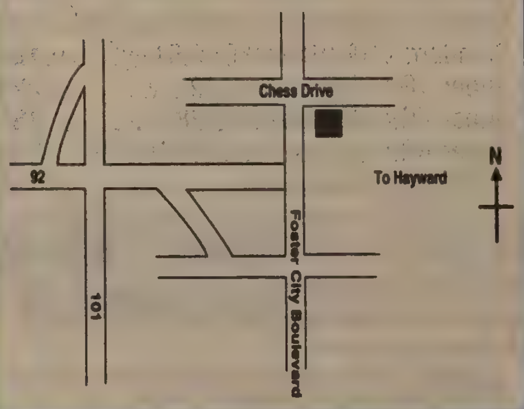
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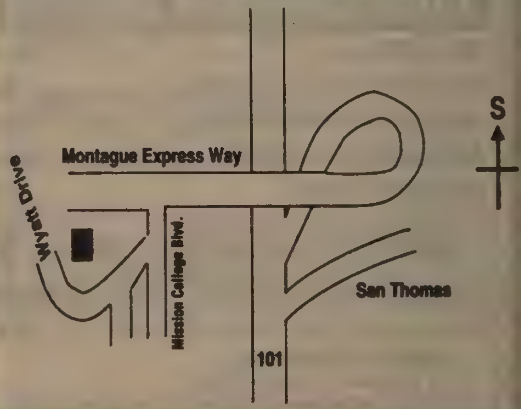
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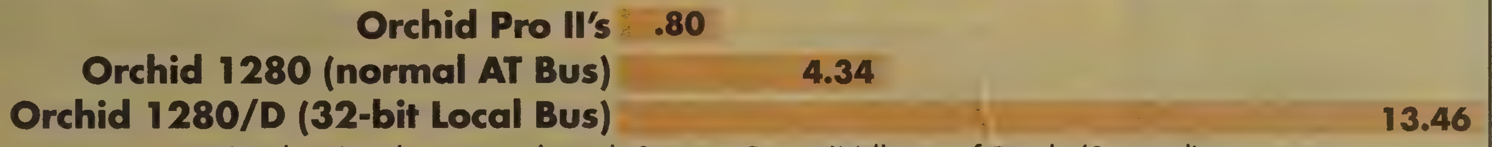

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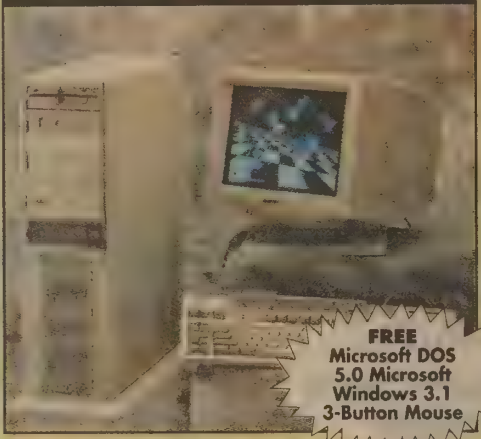

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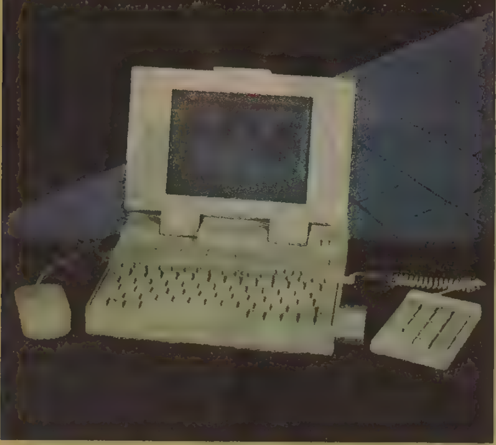

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"The UNIQ 486 EISA server is a lot of computer. The system can provide superb minicomputer performance on a microcomputer budget. For those with high-end networking needs, this UNIQ system should be at the top of the list."

Computer Buying World, October, 1992

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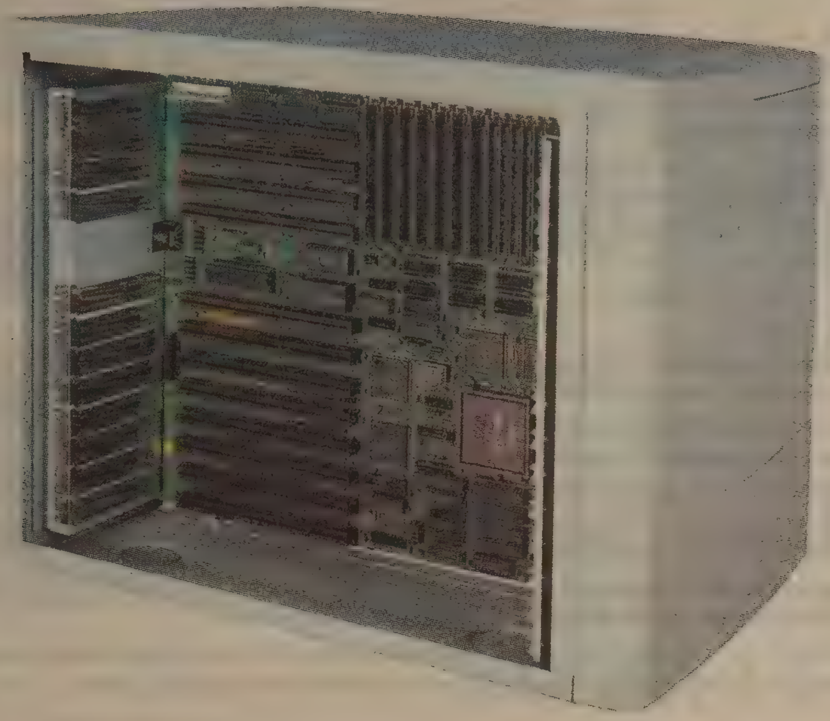
HOOKED ON 486 POWER NETWORKING?

HOW ABOUT A 486/66, 12 SLOT EISA SERVER DIRECT TO YOUR FRONT DOOR!



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- 32 Bit EISA Bus Mastering SCSI-2 Host Adapter
- Double-MidTower "Cube" Case with 6 Drive Bays
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VR Gets Real

Washington's Human Interface Technology Lab Uses Virtual Reality For Practical Problem-Solving

BY RICHARD GREENFIELD

While the idea of a virtual reality laboratory conjures up all manner of science fiction images, the Human Interface Technology (HIT) Lab, located on the campus of the University of Washington in Seattle, is developing and using VR tools to solve the problems of today. Among the consortium of companies that contribute to the lab are Boeing, the Port of Seattle, and U.S. West.

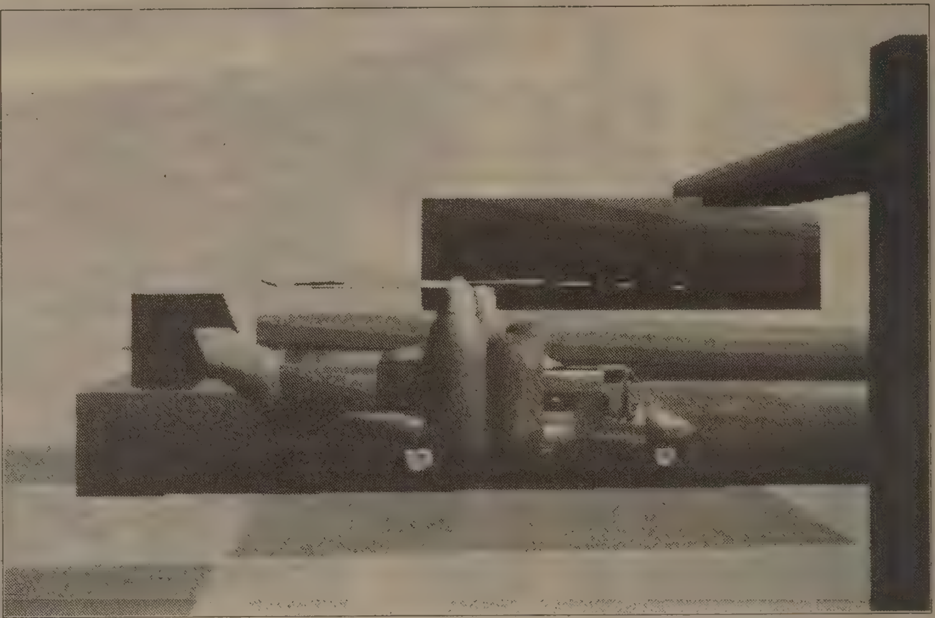
HIT's first project for Boeing involved simulations for a Vertical Takeoff and Landing plane. Another involved Boeing's strategic decision to stick with its long-time practice of building stabilizers and wings controlled by hydraulics, rather than the "fly by wire" computerized surfaces approach used by its European competitor Airbus. Boeing used HIT to model the areas of the wing assembly and stabilizers to make sure they were spaced in such a way that a mechanic could get to them easily.

The Port of Seattle came to the HIT Lab to study a long-range planning problem. As relations and trade prospects improve with Siberia and the formerly Soviet areas of the Far East, Seattle's position as the closest port in the lower 48 states assumes new strategic importance.

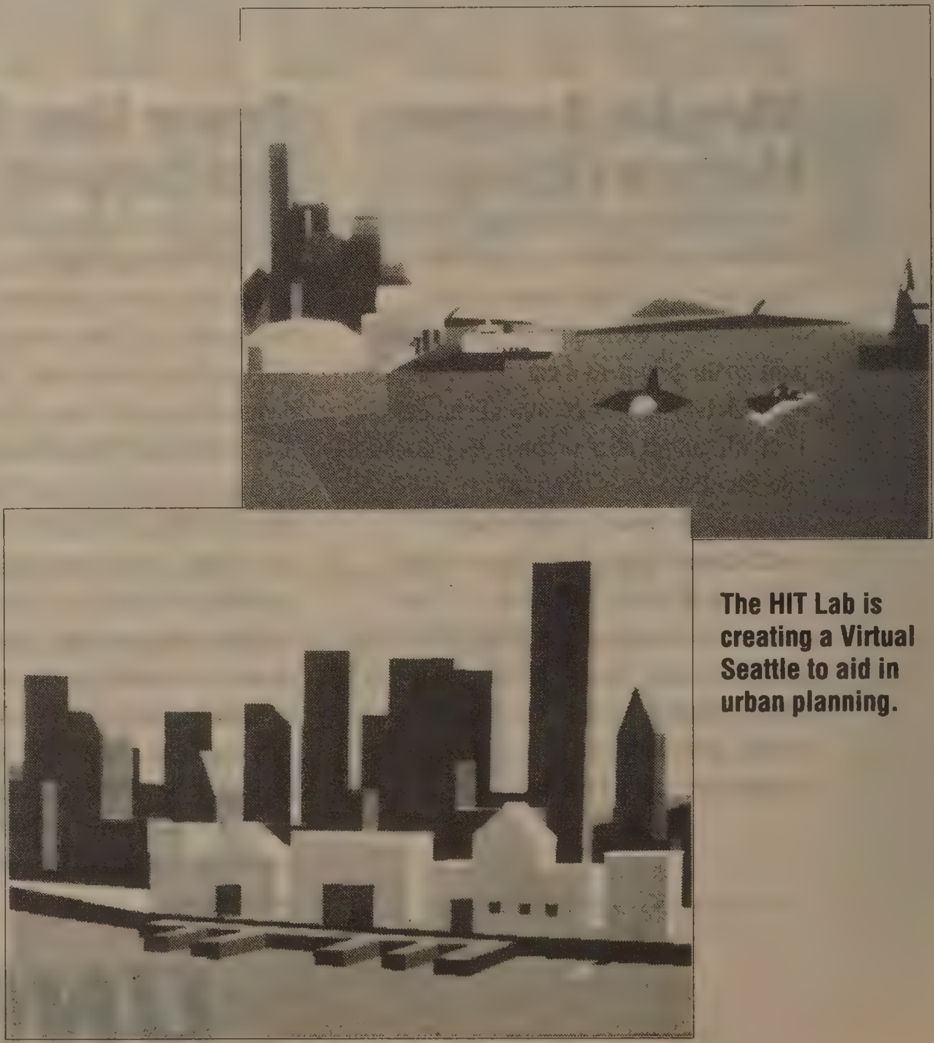
Meanwhile, Seattle-Tacoma Airport is already congested, and clearly some solution must be found. There's a proposal to add a third runway to the airport, but this plan has met with concern and protest from the surrounding neighborhoods. In order to come up with a plan everyone can live with, the Port is considering creating a virtual third runway for Sea-Tac, including realistic sound simulation. Supporters and opponents of the plan would be able to experience and make adjustments to the proposed runway before it was built.

Such an approach would provide a number of advantages not offered by current solutions. Unlike blueprints and diagrams, a virtual world can be experienced with sight and sound, in three dimensions. Objections can be dealt with and modifications added based on informed consensus.

While it is easy to look at VR as an escapist technology or novelty entertainment, the HIT Lab is working on something far more useful—giving us a way to make (and correct) mistakes *before* we have to live with them. ■



Boeing used the HIT Lab's virtual reality technology to model its new VTOL (Vertical Takeoff and Landing) plane.



The HIT Lab is creating a Virtual Seattle to aid in urban planning.

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- ☐ Internal 2400 bps data modem

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- ☐ 101-key keyboard
- ☐ Serial mouse
- ☐ FCC Class 'B'

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- ☐ Mini tower case

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- ☐ 2MB RAM
- ☐ 80MB HDD
- ☐ Desktop case

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- ☐ Desktop case

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System including ...

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- 2MB/4MB RAM
- 2S/1P/1G
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- Dual floppies
- VGA card
- VGA monitor
- DOS 5.0

LanPro Shrink-wrapped Networked System

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- ☆ Dual floppies
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- ☆ 14" SVGA monitor
- ☆ 101-key keyboard
- ☆ Ethernet network card
- ☆ FCC 'B'
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- ☆ 101-key keyboard
- ☆ Ethernet network card
- ☆ FCC 'B'

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Samtron SC-428VS 14" 1024x768 .28 & Trident SVGA 1MB	$329
Samtron SC-441V 14" VGA 640x480 .41 & OAK 512K SVGA 1024x768	$259
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PC Mate internal 2400 modem w/MNP	$35
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SlimPro Booksize Computer

SlimPro 386SX-25MHz	$385

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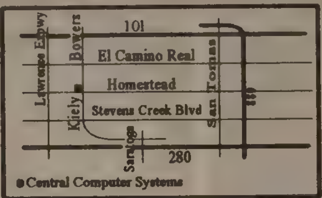

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NETWORK CARD :	
3COM 3C503 8 Bit Adapter	*$ 169*
3COM 3C503 TP 8 Bit Adapter	*$ 199*
SOFTWARE :	
Borland dBase IV 1.5	*$439*
Paradox 4.0 / upgrade	*499/185*
Quattro Pro 4.0	*235*
Quattro Pro 3.0 + upgrade	*199*
Lotus 1-2-3 For Window	*325*
DR DOS 6.0	*45*

I BASIC SYSEMS

ORCHID
(CAD STATION)

ORCHID

486-33 ISA 256K cache
4 MB, TEAC 1.2 FD
Maxtor 130 MB HD, IDE Controller, 2S 1P
Mid Tower Case w/ 220W
Mitsumi 101 Keyboard
AOC 336 1024x768, .28, NI
Fahrenheit 1280-D 1MB VGA
MS Serial Mouse
MS DOS 5.0 & Windows 3.1 2155

MICRONICS
COMPUTERS INC.

1 MB, TEAC 1.2 FD
IDE Controller, 2S 1P
Baby AT Case w/ 200W
Mitsumi 101 Keyboard
MS Serial Mouse
MS DOS 5.0 & Windows 3.1

486-50 EISA 256K cache	1925
486-50 ISA 256K cache	1625
486-33 EISA 256K cache	1555
486-33 ISA 256K cache	1195
386-33 Gemini 64K cache	845
386SX-20 Gemini 64K cache	645

NICE
(MADE IN U.S.A).

1 MB, TEAC 1.2 MB FD
IDE Controller, 2S 1P
Baby AT Case w/ 200W
Mitsumi 101 Keyboard
MS DOS 5.0 & Windows 3.1
MS Serial Mouse

486-50 EISA 256K cache	1525
486-50 ISA 256K cache	1275
486-33 ISA 64K cache	1025

II HARDWARE

1 CD ROM

CAT Sound Audio	55
CD Caddy / Sony CD Caddy	9.50/12
Speakers	25
COREL DRAW	
BlockBuster CD ROM, Corel Draw CD, Artshow CD, w/ SCSI interface, Internal	935
MEDIA VISION	
Multimedia Upgrade Kit w/ pro audio spectrum 16, NEC CDR-84J	925
Pro Audio Spectrum 16	215
NEC	
CDR-74 CD ROM 280ms, 300Kb/s, ext	605
CDR-84 CD ROM 280ms, 300Kb/s, int	545
Interface kit for PC	89
Multimedia Upgrade Kit w/ CDR-74 (SCSI audio board, MS Win Multimedia, Extension, Asymetrix Multimedia Toolbook,speakers, headphones, microphones)	1075
Multimedia Upgrade Kit w/ CDR-84	995
SONY (with controller, no software)	
CDU 535-01 380ms SONY BUS int, hf ht	379
CDU 7205 380ms SONY BUS ext, hf ht	545
CDU 541-01 380ms True SCSI BUS int hf	515
CDU 541-01 without controller	425
CDU 7211 380ms True SCSI BUS ext hf	635
CDU 7211 without controller	555
Sound Blaster Pro CD-ROM Upgrade Kit	
w/ 4 CD titles (no Sound Blaster Pro), int	375
w/ 4 CD titles(no Sound Blaster Pro), ext	449
MIDI Kit	59
Multimedia Kit w/ 6 CD titles, int/ext	525/599
Sound Blaster/ Sound Blaster Pro	97/189
Sound Blaster Pro Basic	155
Creative Lab Video Blaster	349
CD SOFTWARE	
Amanda Story	59
Amazing Universe	55
American Business Phone Book	72
Atlas Pack (World & US)	39/59
Atlas of U.S. President	39
Battle Chess Multimedia	49
Cautious Condor	49
CD Game Pack II	29
Corel Draw Artshow 1991	65
Dr.T's Quest	59
Electronic Cook Book	72
Electronic Home Library	72
Greatest Books Collection	45
Illustrated Encyclopedia 2.0	55
Loom	42
King Quest V	49
Mammals	36
Mavis Beacon Teaches Typing	49
Microsoft Multimedia Development Kit	299
Microsoft Multimedia Beethoven 9th symphony	55
Microsoft Multimedia Bookshelf Win/ DOS	126
Mixed-up Mother Goose	39/45
Monkey Island	39/49
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Prescription Drugs	65
Publish It	59
Reference Library	45
Sante (For Good Health)	65
Secret Weapons of the Luftwaffe	45
Shakespeare	35
Sherlock Holmes	45
Sleeping Beauty	39
Street Atlas	105
The Family Doctor	62
Time Table of History	49
Ultima 1-6	45
US History	65
US Presidents	45
Voyage to the Stars	59
Where in the World is Carmen Sandiego	69
Wing Commander Crusade	55

2 CASES

AT Case W/200W Power	$98
Baby AT w/ 200W Power	79
Baby Tower w/ 200W Power	85
Mid Tower w/ 220W Power	105
Full Tower with 250W Power	139
Black Full Tower w/ 300W Power	225
White Full Tower W/300W Power	199
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WorkStation Case w/ 60W (1 drive bay)	95
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2 half ht or 1 full ht, 60W, 11lbs	119
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1 half ht for SCSI for Mac, 40W	99
2 half ht or 1 full ht for SCSI for Mac, 60W	139
4 half ht or 2 full ht for SCSI for Mac, 180W	229

3 CONTROLLERS

4 Floppies w/ IDE controller for AT	$45
IDE controller for AT	23
Speedstor Plus w/ SCSI controller	75
WA-6 1:1 MFM (Western Digital chipset)	59
ACCULOGIC	
sIDE-2 (2 IDE hard drive only)	26
sIDE-3 (2 FD & 2 IDE HD)	29
sIDE-4 (2 FD & 2 IDE HD, 2S & 1P)	49
ADAPTEC	
1522K SCSI w/ kit (3MB/s)	159
1542B SCSI w/ kit (10MB/s)	269
1542B Plus w/ ASW 310 & ASW 410	339
1640 SCSI w/ kit for MCA	335
1742A SCSI EISA w/ kit (2F & 2H)	459
ASW-1410 ASPI MS-DOS Manager v3.0	79
ASW-310 Sy-Tos Plus (Tape BackUp software)	99
ASW-410 CD-ROM driver v2.1	79
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IN 2000 High Performance 16 Bit SCSI	189
AMI	
SCSI EISA Cache	599
DTC	
3280 SCSI controller	105
3290AS EISA SCSI host adapter	479
6282 1:1 ESDI	125
7287 1:1 RLL	73
FUTURE DOMAIN SCSI Controller	
TMC 1660 for-AT (H only) controller only	139
TMC 1660 for AT (H only) w/ kit	229
TMC 1680 for AT (4F & H) (15MB/s) controller only	169
TMC 1680 for AT (4F & H) w/ kit	259
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Floppy controller (XT)	18
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MICROSOLUTIONS	
CompatiCard IV 4-Floppies Controller (2 ext) 360K/720K/1.2MB/1.44MB/2.88MB FD	115
MYLEX	
DCE 376 EISA SCSI controller w/ 4MB cache	775
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ULT 12F/24 ESDI 32K cache	165
ULT 12C/1 ESDI 1MB cache	455
ULT 22CA ESDI EISA 64Kcache	635
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ULT 14F SCSI 32K cache	239
ULT 24F SCSI EISA 64K cache	459

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SummaSketch II Plus 12x18, 16 button	495
Unitech KD-4000 12x12, 4 button, 4 templates	179

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Frame for 3.5" Hard Drive and Floppy Drive	**8**
Removable Hard Drive Case for 3.5" HD	49
Hard Disk Drive External Casing	see #2

HARD DRIVES

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CP30174E 170MB 18ms IDE 3.5, 1" ht	335
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M2624FA 525 MB 12ms SCSI	1075
M2263FA 680MB 16ms SCSI 5.25" full	1255
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8760-760H 676MB 16ms ESDI 5.25" full	1155
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MXT-7120A 130MB 15ms IDE 3.5"	299
MXT-7213A 213MB 15ms IDE 3.5", 1" ht	415
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LXT 535S 535 MB 13ms SCSI	1035
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SQ400 44MB removable cartridge	79
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2S 1P 1G w/ NS16550AFN chipset (XT, AT)	55
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AT I/O w/ IDE (2S 1P 1G)	39
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13 port Multi-function Cont (2 IDE,4F,4S,2P,1G)	89
13 port I/O w/4-16550UARTS (2 IDE,4F,4S,2P,1G)	125
STB 4-COM, 4S w/16550, support COM 1-8, IRQ 2,3,4,5,10,11,12,15	109

8 KEYBOARDS

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2001 101 click	$45
8000 111 w/ calculator	49
5001 130 keys w/ cursor accelerator	64
NORTHGATE OMNI	
101NI /102	69
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SIIG (click)	
Suntouch Jr. 84-key mini keyboard	49
Suntouch 101	57
OTHERS	
BTC 84-key mini keyboard	39
KEYTRONIC 101	45
MAXI 101	35
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Monterey 101	30

9 MATH CO-PRO, CPU

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80387-DX40	125
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83S87 - SX16/SX20 / SX25	78
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386DX - 25 CPU/33 CPU	95/99
386DX - 40 AMD CPU	99
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10 MEMORY CARDS

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256K x 9 - 80 ns	12

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for HP and Panasonic	see #10 or # 20

MEMORY UPGRADE for

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Konnexx 108 Connects modem to any telephone	$119
Comm-panion Pocket Fax Modem 96/24	129
SmartConnect 9624i Fax Modem	89

EVEREX

Evercom 9600 v.32,v.42,v.42bis,MNP5 Int	395
Evercom 2400 Baud External w/ MNP5	185

FRECOM

Fax 96 w/ 1 Liner & Far Fetch Fax	135
Fax 96 & modem for DOS	119
Fax 96 w/ 1L&FFF & modem for DOS	169

HAYES

Optima 96 v.32,v.42,v.42bis, MNP 5, Ext	389
Pocket edition 2400 w/ Smartcom EZ	129
SmartModem 2400B Internal	245
SmartModem 2400B External	285
Ultra 96 v.32,v.32,v.42,v.42bis,MNP5 Ext.	635
Ultra 144 v.32,v.32,v.32bis,v.42,v.42bis, MNP5, Ext	769
V-series SmartModem 9600 v.42,v.42bis,MNP5,Ext.	499

INTEL

14400EX v.32,v.32bis,v.42,v.42bis Ext	475
Faxability Plus/OCR for Windows	169
SatisFaxtion Modem/100 internal 96/24 fax modem, v.22 bis, v.22 A/B, fax from Dos/Win application WYPIWYF	105
SatisFaxtion Modem/200 internal 96/24 fax modem,v.42,v.42bis, MNP5,fax from DOS/Win application Smart line sharing, Smart UART buffering, WYPIWYF	299
SatisFaxtion Modem/400 internal 96/144 fax modemv.32,v.32bis, v.42,v.42bis,MNP5, fax fromDOS/Win application,smart UART buffering, smart line sharing, WYPIWYF	435
SatisFaxtion Modem/400e external, 4K data buffer,WYPIWYF	499

MACRONIX

MaxLite 96/24 fax modem, int.	88
MaxLite 96/PC pocket fax modem v.32,v.42, v.42bis, MNP5, w/ WinFax software	329
MaxLite 144/PC pocket fax modem v.32bis, v.42, v.42bis, MNP5, w/ WinFax software	389

PRACTICAL PERIPHERALS

PM14400FX96 (14.4 modem 96 fax) v.32bis, int	369
PM14400FX96SA v.32bis, ext.	439

US ROBOTICS

Courier 144 v.32,v.32bis,v.42,v.42bis,MNP5, Int	535
Courier 144 v.32,v.32bis,v.42,v.42bis,MNP5, Ext	555
Courier HST-DS 144 v.32,v.32bis,v.42,v.42bis,MNP5, Ext	775
Sportster 2400 modem w/ Sierra Game int/ext	99/109
Sportster 96 Modem MNP5 Int	259
Sportster 9696 FAX MNP5, Int/Ext	289/319
Sportster 14.4 v.32bis, v.42bis, Int.	309
Sportster 14.4 v.32bis, v.42bis, Ext	339
Sportster 96/14 4 fax modem MNP5, Int/Ext	319/349
Shared Access Modem Sharing Kit	675

ZOLTRIX

2400 baud modem w/ MNP5, Int.	49
96/24 send & receive fax/modem w/ MNP5, int	75
96/24 send & receive fax/modem MNP5 v.42, Int	105
Pocket send & receive fax/modem, Ext.	139

ZOOM

96/24 fax modem v.42bis, MNP5 Int / Ext	95/115
FC9624V/FX9624V	135/155
96/96 fax modme v.32, v.42bis, MNP5 Int / Ext	245/265
144/144 fax modem Int / Ext	299/329

13 MONITORS

9" VGA mono paper white	135

EMC

EM 1412 14" Mono paper white	95
EM 1417 14" 1024x768 VGA paper white	115
EM 1428 14" 1024x768 .28	289
EM 1439 14" 1024x768 .39	249

GOLDSTAR

1460 Plus 14" 1024x768	289

MATSUSHITA (VIEWSONIC)

Viewsonic 1 14", 640x480, .39, Int	235
ViewSonic 4e 14", 1024x768, .28, Int.	315
ViewSonic 5+ 14", 1024x768, .25, NI	525
viewSonic 5e 14", 1024x768, .28, NI	425
ViewSonic 6e 14", 1024x768, 28, NI	355
ViewSonic 6FS 15", 1024x768, .28	629
ViewSonic 7 17", 1280x1024, .28, NI	1075
ViewSonic 8 20", 1280x1024, .31, NI	1595

MITSUBISHI (w/ base)

HL6605ATK 16", 1280x1024, NI	925
HL6955SETK 20", 1280x1024, .31, NI	1745
BNC Cable	39

NANAO

9070U 16", 1024x768, .28 NI	795
9080i 16", 1280x1024, .28 NI	975
T560i 17", 1280x1024, .25, NI	1895
F550i 17", 1280x1024, .28, NI	1175
T660 20", 1280x1024, .31 NI	1825
T660i 20", 1280x1024, .31, NI, Trinitron	2595

NEC

3FGX 15", 1024x768, .28	649
4FG 15" Flat, 1024x768, .28, NI	749
5FG 17" Flat,1280x1024, .28, NI	1375
5D 20" 1280x1024, .31, NI	1595
6FG 21" Flat, 1280x1024, .28	2595
Monitor Lens (Anti-reflection, Anti-static) for 4FG / 5FG / 6FG	74/115/185

PANASONIC

C1381i 14" Super VGA, 1024x768, .28, Int	325
C1395 14" 1024x768, .28, NI	445
C1991 20" 1024x768, .31, NI	1495

POWER II

3E 14" Super VGA, 1024x768, .28, Int	285
4A 14"Multisync, 1024x768, .28, NI	319

SAMSUNG

MA2565 12" mono amber	75
MZ4571 14" mono paperwhite	115
ML4571 14" VGA mono 640x480	125
CVM4967 14" 1024x768, .28	305
CSD5577 15" Flat, 1024x768, .28, NI	499
CSA 7571 17", 1024x768, .31, NI	799
CSF7487 17", 1280x1024, .26, NI	1025

SEIKO

CM1450 14", 1024x768, .25, NI	529
CM2050 20", 1024x768, .31, NI	1545

SIIG

9" Mono paper white	115

SONY

1304S 14", 1024x768, .25, NI	575
1604S 17", 1024x768, .25, NI	1055
1791 17", 1024x768, .25, NI, (1604S oem)	995
1936 20", 1280x1024, .30 NI	2399

14 MOTHERBOARDS

286-16	$95
386-40 64K cache w/o CPU(w/ CPU)	129(219)
upgrade tp 256K cache	50
486-33 w/ 64K w/o CPU(w/ CPU)	155(535)

AMI

Mark V 386-33 w/ 64K/256K cache	480/595
Super Voyager 486-33 64K/256K	875/995
Super Voyager 486-50 64K/256K	1285/1395
Enterprise II 486-33/50 EISA w/ 128K	1295/1595
EZ-Flex 486DX-33/50 CPU card	955/1550
AMI Diag	95

DTK

386SX-25	195
486-33 64K cache (Novell certified)	695

GENOA

Express 486-50 w/256K for Local Bus Color Bahn Multimedia VGA & Turbo	1085

MICRONICS

386SX-20 Phoenix BIOS (32MB max)	215
386SX-25	235
386-33 64K cache Gemini (32MB max)	415
486-33 256K cache ISA	775
486-33 256K cache EISA E2	1125
486-50 256K cache ISA	1195
486-50 256K cache EISA	1495
486-33 Local Bus w/256K cache	995
486-50 Local Bus w/256K cache	1195
486-66 Local Bus w/256K cache	1475

MICRONICS ACCESSORIES

4MB Piggy Back (up to 8MB)	399
16MB Memory Card	150
upgrade to 256K cache for old 486-33	80

NICE

486-33 64K/256K cache	595/635
486-50 256K cache	845
486-50 256K cache EISA	1095
upgrade to 256K cache	60

ORCHID

486-33 256K cache, AMI BIOS (32MB max)	745
486-50 256K cache ISA	995
upgrade to 256K cache for 486-33	80

QUICK-PATH

486-50 w/64K cache, 15ns ISA	885
486-50 w/256K cache, 15ns EISA	1125
upgrade to 256K cache for 486-50 ISA	80

SPRITE

SM486-33 128K cache	555
SM486-33 256K cache	585
SM486-66 w/256K & CPU	1295

UMC 286-12	79

15 MOUSE

AERO

IMPC-60 3 button mouse	18
IMPC-40 trackball	29

APPOINT

MousePen Pro for PC / Portable / Mac	67
Thumbelina for PC / Portable / Mac.	67

GENIUS

CLIX 3-button	19
GM-F302 mouse (3 button, PS/2 compat)	42

KENSINGTON

Expert mouse serial trackball /Bus	99/115

LOGITECH

Cordless Mouse	79
Dexxa Serial Mouse	27
First Mouse Serial	37
Mouseman Bus	64
Mouseman Serial PS/2 combo	65
Mouseman Serial PS/2 combo/ 5 pack	57/275
Mouseman Serial w/ WIN 3.1	115
Scanman 32	147
Scanman 32 with OCR software	189
Scanman 256	249
Scanman 256 with OCR software	299
Trackman Bus	69
Trackman Portable	99
Trackman Serial	59
Trackman Combo	69

MICROSOFT

Ball Point Mouse (portable)	119
Bus Mouse 400PPI	85
Bus Mouse (400PPI) w/ Windows 3.1	149
Serial Mouse 400PPI	65/85
Serial Mouse (400PPI) w/ Windows 3.1	149

MOUSE SYSTEMS

Omni Mouse (2 button)	25
PC Mouse III Serial (optical)	69
PC Trackball II	55
Bus Mouse Card (for any kind of mouse)	30
The White Mouse w/ Power Panel	56

16 NETWORK

3COM

3C503 8 bit coax ethernet / 5 pack	169/799
3C503-TP 8 bit TP ethernet / 5 packs	199/950
3C503 coax / 3C503-TP 16 bit Ethernet	169
3C507 16 bit coax ethernet / 5 packs	279/1250
3C507-TP 16 bit TP ethernet / 5 packs	299/1450
3C509 coax / 3C509-TP Etherlink III	139
3C523B Etherlink/MC for PS/2 / 5 packs	289/1210
3C523B-TP TP for PS/2 / 5 packs	319/1435

ARTISOFT (Lantastic)

AE-2 Ethernet starter kit, 10Mbps v4.1/win	459/485
AE-3 Ethernet starter kit, 10Mbps v4.1/win	535/565
10BaseT starter kit v4.1	595
2Mbps starter kit v4.1	355
Z (2 stations) v4.1	89
AI software (individual node) v4.1	69
Ethernet Software Kit (NOS) v4.1	79
AE-2 Ethernet adapter	199
AE-2 MCA Ethernet adapter	275
AE-3 Ethernet adapter	235
AE-2/T 16bit 10Base-T adapter	210
AE-1/T 8bit 10Base-T adapter	135
2Mbps adapter	145
64K RAM upgrade for AE-2, AE-3 adapter	45
Articom (LAN modem sharing software)	269
Lantastic for Netware	139
Lantastic for Windows Network Utilities	165
Central Station Connectivity Processor	405
Lantastic Print Server Station Ware	69
Netware Print Server Station Ware	69
Peer-Hub 10Base-T concentrator	270
Peer-Hub AUI interface kit	270
Network Eye (Remote Control Access)	129
Remote Boot ROM for AE-2, AE-3 adapter	45
Sounding Board adapter kit	72

CASTELLE

FaxPress (Network Fax Server) Fax from within DOS or Win application, supports PCL,Postscript emultion, supports Novell, MS LAN, IBM LAN (different model)	
Novell 1 line ethernet coax	2595
Novell 2 lines Token Ring 16/4Mbps	3225
JetPress (Network Print Server) for HP II,IID,III,IIID, supports thin ethernet and 10BaseT, supports up to 32 queues on up to 8 file servers	429
LANPress (Network Print Server) connects up to 4 printers, supports up to 32 queues on up to 8 file servers	
Ethernet Thick/Thin coax (1P 3S)	489
Ethernet Thick/Thin coax (2P 2S)	625
Ethernet 10BaseT (1P 3S)	489
Ethernet 10BaseT (2S 2P)	639

CC:MAIL

cc:Mail DOS platform / Windows platform	149/339
cc:Mail 8 user pack / 25 user pack v3.2.	129/399

COMPULAN

8 bit E100 coax	95
16 bit E200 coax	105
16 bit E300 coax dual-port shared memory.	129
16 bit E210 combo, BUS mastering, Surface Mount.	159
16 bit E650 combo, Surface Mount	149
32 bit E950 combo ethernet	229
32 bit E900 coax	249
16 bit E200/2 coax for MCA	145
16 bit E800/2 coax dual-port shared memory MCA	155
8 bit ET500 TP ethernet	109
16 bit ET600 TP ethernet	125
Boot Prom	25
Pocket adapter for arcnet	135
Pocket adapter for coax / TP ethernet	185
8 port concentrator (10BaseT ethernet)	349
12 port concentrator (10BaseT ethernet)	520
Token ring T1000 16/4Mbps	349
Token ring T1000/2 16/4 Mbps for MCA	379
8-port MAU Type 1 cable, DB9 shielded TP	329
8-port MAU Type 3 cable, RJ45 unshielded TP	279

FARALLON

PN380 PhoneNet card PC for LocalTalk	203
PT100 PhoneNet talk for PC	145

GATEWAY COMMUNICATION

G/Ethernet 16 coax / 16 TP	159/179

GENIUS LAN

Ethernet 8-bit NE1000 Coax compatible	99
Ethernet 16-bit NE2000 Coax compatible	109
Ethernet 16-bit NE2000 10BaseT compatible	129
Ethernet 8 port TP+ 1BNC Concentrator	325
12-port TP+2AUI+2BNC concentrator	529
Ethernet "LAN Ready" (Starter Kit)	
for Lantastic, 16 bit coax	375
for Lantastic, 16 bit 10BT	409
for Netware Lite, 16bit coax	379
for Netware Lite, 16bit 10BT	415
Ethernet Thin coaxial pocket adapter	185
Ethernet 10BaseT pocket adapter	185
Arcnet 16 bit "4-in-1" card(coax, TP, Star, Bus)	75
Arcnet 4-port Active Hub, int, coax	54
Arcnet 8-port Active Hub ext, coax or 10BaseT	129
Token Ring card 16 bit, 4/16 Mpbs (IBM chipset)	489
Token Ring card MCA, 16-bit, 16Mpbs (TI chipset)	399
8-port MAU w/ Type 1 connection	299
8-port MAU w/ Type 3 connection	349

INTEL

EtherExpress 16	135
EtherExpress 16TP	145
EtherExpress 32 EISA	553
EtherExpress ISA Hub Adapter	585
EtherExpress EISA Hub Adapter	685
NetPort II Thin/Thick Ethernet	519
NetPort II 10BaseT	529
NetPort II Token Ring	669
NetSatisfaxtion	635
TokenExpress 16/4 for ISA / EISA	535/685
TokenExpress 16/4 for MCA	535

NOVELL

8 bit NE1000 coax ethernet	115
16 bit NE2000 coax ethernet	165
16 bit NE2000TP TP ethernet	175
32 bit NE3200 coax	699
NE10T-Hub 4 Port Concentrator	235
NE10T-Hub 8 Port Concentrator	349
Netware Lite w/ DR DOS 6.0	69
Netware 2.2	
5 users / 10 users	489/1089
50 users / 100 isers	1925/2955
Netware 3.11	
5 users / 10 users	619/1369
20 users / 50 users	1925/2799
100 users / 250 users	3859/6885

SMC (WESTERN DIGITAL)

8 bit coax Ethercard Plus Elite	129
6 pack	715
16 bit coax Ethernet Plus Elite / 6 pack.	155/895
16 bit TP Ethercard Plus Elite 16T	169
16 bit TP Ethercard Plus Elite 6 pack	975
Ethercard Elite 16 combo (coax/10BaseT)	225
Ethercard Plus/A for PS/2	219
Netware Boot ROM	34
8 Port Concentrator (10 Base T Ethernet)	339

XIRCOM

PE2-10B2 Pocket Adapter Ethernet coax	325
PE2-10BT Pocket Adapter Ethernet 10BaseT	357
PT2-16B3 Pocket Adapter Token Ring 16/4Mbps	615

CABLES & ACCESSORIES

10 BASE-T Twisted pair cable, 1000', PVC	95
10 BASE-T Twisted pair cable, 1000'	165
RG58, 1000'	109
Belden 8259 RG58 1000'	165

17 POWER SUPPLIES

AMERICAN POWER CONVERSION (UPS)

APC-400 Smart-UPS (286, 386 WS)	309
APC-600 Smart-UPS (386, 486 FS)	399
APC-900 Smart-UPS (386, 486, FS and WS).	639
APC-1250 Smart-UPS (multiple FS and WS).	799
APC-450 Back-UPS 286, ps/2, 386	235
APC-600 Back-UPS 286, 386 FS	299
APC-800 Back-UPS 800RT, 2-4ms, 15 mins	565
APC-750 On-Line UPS (286, 386, 486 FS)	1365
APC-1500 On-Line UPS (multiple servers)	2499
APC PowerChute for Novell	79
APC PowerChute for UNIX	79
Power Doctor (for DOS) I/F kit for Smart-UPS	79

PC POWER COOLING

Standard 220 desktop/full tower	95
Silencer 270 desktop/slim/full tower	175
Turbo-Cool 300	
slim (baby & mid tower)	165
AT desktop/full tower	185
Turbo-Cool 450 desktop/full tower	345
InnerSource 2210 UPS int, 95-132 VAC, 220W DC, 100W AC, equivalent to 550 VA external UPS	355
Novell Netware Interface for InnerSource 2210 UPS	55

OTHERS

150W / 200W (XT) (UL)	40/48
200W / 230W for Baby AT & Mid Tower	45/55
230W for AT	48
230W for FullTower	59
300W for Full Tower	89
550W / 1200W (UPS)	279/999

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BJ-10ex (Bubble jet)360 dpi,37K buf	289
Auto Sheet Feeder	79
Other Accesories same as BJ-20	
BJ-20 w/ Auto Sheet Feeder	409
Bag / Battery	39/45
Print Head Cartridge	22
CITIZEN	
GSX 200 (9 pin)	165
GSX 130	205
GSX 140 Plus (24 pin)	269
Color Option for above printers	45
Auto Sheet Feeder for GSX 140	109
GSX 145 (24 pin, 132 column)	355
Color option for GSX 145	65
GSX 240 Scalable Fonts & quiet	329
PN48 notebook printer,1ppm,2lb,battery,case.	325
FUJITSU	
DL1100 mono	275
HEWLETT PACKARD (LaserJet w/ toner)	
Desk Jet 500	395
Desk Jet 500C	599
Jet Ram Memory 256K for 500 & 500C	69
Laser Jet IIP+	775
Laser Jet III	1425
Laser Jet IIIP / IIID / IIISi	995/2395/3495
Accessories	
Envelope Tray(15 envelopes) for III	69
Envelope Tray for IIP,IIIP	79
Envelope Feeder for IIID	295
HP Postscript Cart. for IIP, IIP+, III, IIID.	395
Legal Tray for HP II, III	69
Lower Cassette (w/ letter tray) IIP,IIIP	149
Toner for HP II, III	79
Toner for HP IIP, IIP+, IIIP	66
Jet Ram Memory for HP II	
2MB / 4MB	135/205
Jet Ram Memory for HP IIP, IIP+,III,IIIP,IIID	
1MB / 2MB	75/115
3MB / 4MB	155/195
MICROTEK	
Scan Maker 600Z	1295
TrueLaser 6ppm,2MB,35 fonts	1355
PACIFIC DATA PRODUCTS	
ProTracer inkjet printer/plotter, A- to C-size output, 360dpi, i960RISC processor, 512K, 45dBA	1075
5 MB memory upgrade	439
8 MB memory upgrade	669
postscript emulation card	375
HP-GL Emulation Card	325
sheet feeder I	115
sheet feeder II	105
ink cartridges	19.50
PANASONIC	
1180i / 1123	158/199
1124i / 1624	285/349
Auto sheet feeder for 1124 only KX-P36	120
2123 24 pin, 43.5dBA, color capability	239
2124i 24 pin, 43.5dBA, color capability	319
2180 9 pin, 45dBA, color capability	169
Color upgrade kit KX-PCK11	49
Single bin cut sheet feeder KX-PT10	95
2624 (24 pin, quiet printer 46 5 dBA)	375
32K Buffer dot matrix printers KX-P43	65
Serial interface card KX-P19	75
4410 Laser, 512K 5ppm	619
1MB mother Ram board KX-P444	115
1MB daughter Ram board KX-P445	99
LaserBoard 1MB (3rd party)	105
Corona KX-PCR3	45
Developer KX-PDP4	105
Drum KX-PDM4	89
Extra Cassette KX-PKC2	45
Fonts Card KX-P47x	95
Fuser Unit KX-PFS5	105
Optional Second Cassette KX-P495	135
Toner KX-P453	35
4430 Laser, 1 MB, 5ppm	885
Accessories same as 4410	
4420 Accessories	
RamBoard 1MB / 2MB / 4MB	99/139/219
Developer KX-PDP2	95
Drum KX-PDM2	99
Envelope Tray KX-P431	59
Fonts Card	95
Legal Tray KX-P425	45
Ozone Filter KX-PFT2	26
Toner KX-P451	39
4450 Accessories	
RamBoard 1MB	139
others same as 4450i	
4450i Laser, 11ppm	1099
RamBoard 1MB / 2MB / 4MB	99/139/219
Developer KX-PDP1	95
Drum KX-PDM1	145
Envelope Tray KX-P430	59
Fonts Card	95
Legal Tray KX-P420	45
Ozone Filter KX-PFT1	29
Toner KX-P450	35
4455 (Postscript) 11ppm	1715
RamBoard 2 MB	159
others same as 4450i	
QMS (Adobe Postscript)	
QMS-PS 410 4ppm, 2MB, 45 Fonts	1375
1MB / 2MB / 4MB Memory	125/165/245
Envelope / Legal / Letter Tray	69/69/69
Lower Cassette with Letter Tray	160
Toner	95
SEIKO	
Smart Label Printer Plus (IBM/APPLE)	159
Box of Label (2 rolls per box)	10.95
TEXAS INSTRUMENTS	
MicroLaser Plus PS17 / PS35 9ppm	1155/1455
Apple Talk Kit / Ram Board 1MB	99/69

LASER PRINTER ACC.

COMPUTER PERIPHERALS	
Jet Page (for HP II)	295
GENESIS	
JetTray 250E, holds 250 #10 envelopes	469
IQ ENGINEERING	
Super Cartridge 1 for all HP Laser&True HP Compatibles	139
Super Cart. 2 for HP II, IID, IIP, IIP+, III, IIID	249
Super Cartridge 2 & 2LC	269
Super Cart. 3 Pro+ for HP III,IIID,IIIP,IIISi	249
Super Cart. 3 Creative Collection for III family	249
Desk Jet 500 Professional	99
Desk Jet Plus Professional	99
LASER MASTER	
WinJet 800 800dpi, Postscript adapter for HP II,IID,III,IIID	699
PACIFIC DATA	
25 in One! III (for Deskjet 500)	99
25 in One! III (for HP II, IID, IIP, IIP+, III, Microtek)	245
Complete Font Library for HP III, IIID, IIIP	255
Font Bank (NEW) (for all HP Laserjet) stores soft fonts, 0 75MB / 1.5MB	205/269
Headlines Cartridge for HP II, IID, IIP	185
MacPage Driver and Connection Kit for Mac & HP II, IID, IIP, IIP+, III, IIIP	95
Paicfic Connect (for HP II, IID, IIP, IIP+, III, IIID, IIIP) connect up to 5 PC and/or Mac to a printer 256K/1.25MB	265/299
Pacific Page & 2MB (Postscript for HP II)	389
Pacific Page II / XL(postcript for HP II)	719
Pacific Page P.E. (for HP IID,IIP,IIP+,III,IIID, IIIP)	269
Pacific Page P.E. & 2MB	405
Pacific Talk	179
Pacific Page XL (for HP IIP, IIP+, III, IIID, IIIP) Postscript emulation cartridge comes with 2MB & accelerator board 8 times faster than other cartridges	649
Pacific Print for network & HP II, IID, IIP, IIP+, III, IIID, IIIP	99
Plotter in a Cartridge (for HP II)	225
Plotter in a Cartridge P.E. for HP IID, IIP, IIP+, III, IIID, IIIP	225
1-2-4 Plus (for HP II, IID) 1MB/2MB/4MB	115/155/235
Pacific 4 Memory (for HP IIP, IIP+, III, IIID, IIIP) 1MB/2MB/4MB	95/135/215
Pacific Si Memory (for HP IIISi) 1MB / 4MB	85/215
LP Memory (for IBM 4029E) 1MB/2MB/3 5MB	129/179/249
Pacific T Memory (for Epson 6000) 2MB / 4MB	209/299
PELICAN All type ribbons	visit us

19 SCANNER

TAMARACK ArtiScan Flatbed Scanner 24 bit color, 256 gray levels, comes with Picture Publisher LE 3.0 and Recognita plus OCR or PhotoStyler Full 1.1 only, SCSI interface

TTI 6000C 600dpi	1195
TTI 8000C 800dpi	1495
Slide Scan Kit (transparency,slide,X-ray)	695
MICROTEK Scan Maker 600Z	1295
Hand scanners	see Logitech in section #17

20 TAPE BACKUP

COLORADO	
DJ-10 (120MB) QIC-40 w/ cable	$189
DJ-20 (250MB) QIC-80 w/ cable	255
AB-11 External tape port	45
Cable (2 Floppies & tape back up)	9
FC-10 Controller	95
KE-09 Ext kit w/o controller	75
TC-15 controller w/ data compression	195
Unix/Xenix driver for DJ-10, 20	99
QFA-700 (700MB)	725
TC-02 adapter (required)	259
EVEREX	
EV-811 8 bit adapter QIC-02 for XT,AT	105
EV-880 floppy tape adapter for AT	65
MICRO SOLUTIONS (External)	
120MB / 250MB External (printer port)	365/425
MOUNTAIN NETWORK SOLUTIONS	
FS1200 1.3GB,4mm,SCSI cont,int/ext	3595/3905
FS2100 2 2GB, 8mm, w/ SCSI cont, ext	4895
FS7250 150-250MB, QIC-02, w/ cont, ext	1435
FS7250 250MB, w/ SCSI cont, ext	1565
SUMMIT	
SE120 120MB w/ Central Point Back up	195
SE250 250MB w/ Central Point Back up	265
SE305 350MB Backup	369
Accelerator board for SE120 & SE250	165
CASSETTES	
3M, VERBATIM	**call**

21 VGA CARDS

All cards 1024x768 except as stated

CGA card	$29
MGP card (Monographic w/ Printer)	29
ET4000 Tseng Lab 1MB	109
Hauppauge Win/TV (New)	465
Oak067 Super VGA 512K	55
Oak077 Super VGA 1MB	79
Prolab Video Master	185
Video Blaster	349
SVGA 256K	55
AMI	
FastView EISA VGA Graphics w/ 1MB	549
ATI	
VGA Stero 512K w/ speakers	269
Wonder XL OEM w/ 1MB	115
Wonder XL series w/ mouse, 1MB, Hi-color	169
Graphics Ultra Plus 1MB (VRAM) w/ mouse	355
Graphics Vantage Plus 1MB(DRAM) w/mouse	255
DIAMOND	
SpeedStar 24X w/ 1MB 16 million colors	189
Speedstar 24 bits w/ 1MB 16 million colors	159
Stealth 1MB, VRAM, w/Sierra Hi-color	225
EVEREX	
Viewpoint NI 256K/512K	129/149
GENOA	
7900 Multimedia VGA 1MB, Hi-color, 16 million color, 24 bit	159
8860 1MB 1280x1024 Hi-color	239
M2100 VGA2TV	425
MYLEX	
GLE911 EISA, 1280x1024, 1MB	409
GXE020B 1280x1024, 4MB DRAM 2MB VRAM, TMS34020, Tiga/EISA	1039
NUMBER NINE (TI34020)	
GXI Lite Level 21 1024x768 16 colors at 72 Hz	call
GXI Level 23 for CAD/Win 1280x1024 16 colors at 72Hz, 1MB VRAM 1MB DRAM	1209
GXI Level 24 for Windows 1280x1024 256 colors at 72Hz, 2MB VRAM	1279
GXI Level 25 for CAD/Win 1280x1024 256 colors at 72Hz, 2MB vram 1MB dram	1429
GXI Level 29, 24 bit 1280x1024 65536 colors at 72 Hz 4MB vram 1MB dram	1719
ORCHID	
Fahrenheit 1280 1MB with Hi-color, 12x10	225
Fahrenheit 1280-D 1MB with Hi-color	225
Fahrenheit 1280 w/ Accelerator 24 bit	235
ProDesigner IIs 1MB with Hi-color	139
ProDesigner IIs-D 1MB with Hi-color	189
ProDesigner IIs, 1MB, Hi-color for MCA	379
UNITED SOLUTIONS	
Utra 1MB 1280x1024 Hi-color	139

III SOFTWARE

ADOBE	
Illustrator 4.0 for Windows	359
Plus Pack for Mac / Windows	119
Postscript Cartridge for HP II	239
Type Cartridge 1: Display Faces	99
Type Cartridge 2: Best Sellers	99
Streamline for Windows (special)	99
Type Align for Windows	63
Type Manager for Windows	59
Type Set 1/2/3 for Windows	65/65/129
Type Set: Invitations & Awards	87
Type Set: Letter, Memos & Faxes	87
Type Set: Overheads & Slides	87
Type Set: Spreadsheets & Graphs	87
AUTODESK	
AutoSketch for windows	182
Generic CADD 6.0	299
Multimedia Explorer	120
BORLAND	
C++ Professional 3.1 for Windows	325
C++ 3.1 for Win & Application Frameworks	485
dBase IV 1.5 (special)	439
Paradox 4.0 / upgrade	499/185
Quattro Pro 4.0/ upgrade	235/85
Buddle of Quattro Pro3.0 + upgrade	199
Screenery (Windows wallpaper, screen saver)	25
Turbo C++ for Dos / Windows	69/105
Turbo Debugger & Tools 2.0	99
Turbo Pascal for Windows / Dos	119
IBM	
OS/2 2.0 / Upgrade	145/99
MICROSOFT	
DOS 3.3 / 4.01	59/19
DOS 5.0	55/65
Entertainment Pack for Windows I / II / III	28
Excel 4.0 for Windows / Upgrade	299/97
Excel 4.0 for Win Competitive Upgrade	125
Flight Simulator	39
Joystick Warrior 5	14.50
Maxx II Control Yoke for PC	49
Maxx Pedals for PC	39
Lan Manager v.2.1, 1 - 10 user	1299
every additional 10 users	659
unlimited pack(must purchase 1-10 usr)	3599
Microsoft C/C++ 7.0 w/ SDK (Upgrade)	315(135)
Money for Windows	49
Multimedia Development Kit	299
Office for Win(Excel, Word, Power Point, Mail)	469
PC Mail Server for DOS & Windows	435
Power Point for Windows/upgrade	299/97
Project 3.0 for Windows/upgrade	419/145
Publisher for Windows	125
Quick Basic Compiler 4.5	65
Quick C for DOS / Windows	69/125
Quick C Compiler w/ Quick Assembler	125
Software Development Kit (SDK)	305
Visual Basic for Windows	125
Visual Basic Pro Tool Kit	125
Windows 3.1/up grade	65/49
Windows 3.1 Device Driver Development Kit	315
Word for DOS / Windows	207/299
Word for Windows upgrade to v2.0	125
Works for DOS / Windows	95/125
SANTA CRUZ OPERATIONS (SCO)	
SCO C++	915
SCO ODT Personal System 1.1	1170
SCO ODT Personal System 1.1.1 (tape)	1086
SCO Multiview 386 1.6.1	299
SCO XENIX-NET 386 single server v1.3.0	685
UNIX 386 Dev Sys 3.2.2 C-Compiler & Dev Tools	995
UNIX 386 GT Oper Sys 3.2.2 Multiuser	995
UNIX Operating System 3.2.4	899
XENIX 386 Dev Sys 2.3.1 C-Compiler& Dev Tools	610
XENIX 386 GT Oper Sys 2.3.4	585
VENTURA SOFTWARE	
Ventura Publisher 4.0 Education special DOS / Windows / Mac	199
Ventura Publisher Gold 4.0 for win	399/489
Ventura Publisher 3.0 w/ up grade	465
WORDPERFECT	
DataPerfect / DrawPerfect	265/265
Figure Library (Bus/Edu/Fig/Holiday/Leisure)	79ea
LetterPerfect / PlanPerfect	115/235
WordPerfect 5.1 for DOS / Windows	249/255
WordPerfect Trade up (from DOS to Win)	75
WordPerfect Executive/Office/Works	145/95/169
OTHERS	
3-D Charts to go	52
After Dark for Windows (screen saver)	29
Aldus Freehand 3.0 for Windows	379
PageMaker 4.0 for Windows	469
Persuasion 2.1 for Windows	325
Photostyler 1.1 for Windows	499
Automap (road atlas)	55
CALERA Wordscan	615
Carbon Copy Plus 6.0 / for Win.	119/112
Central Point Anti-virus / Backup 7.1 oem	53/20
PC Tools 7.1 (w/ Anti Virus)	99 (115)
Check-It	85
Claris Hollywood for Window	305
Clipper 5.01	479
Corel Draw 3.0/ upgrade	365/147
Correct Grammer for DOS/Windows	49/59
Definition Plus! (American Heritage Dict.)	59
Direct Access 5.1	63
DR DOS 6.0 (special)	45
FaceLift for WordPerfect	61
Fastback Plus 3.04/for Win	117/117
Fax Grabbler w/ Norton Desktop for Win	99
Fax Pak (WinFax Pro, Grabbler, Desktop)	145
Fox Pro 2.0	459
Geoworks Pro	122
Grammatik V for DOS / Windows	57
hDC Windows Express	55
Hardvard Graphics for Windows/DOS	375/399
Home Bundle (HomeDesign and Landscape)	24
Intermission for Win (screen saver)	29
LapLink Pro v4	102
Lotus 1-2-3 for Windows (special)	325
1-2-3 Rel 3.1+ for DOS	389
Ami Pro for Windows	279
MacPrint	85
Master Piece True Type Library	69
MicroGrafx Designer 3.1	355
More Fonts / Display Faces	77/77
Norton Anti-Virus 2.0 / Backup 1.2	85
Desktop 2.0 for Windows	102
Utilities 6.01	112
PC Anywhere 4.5 Remote and Host	115
PFS: First Choice (w/ Prodigy start-up kit)	79
Pacioli 2000	24
Pro-scan (virus identifier & remover)	40
Procomm Plus 2.1/win	69/85
Qualitas 386Max v.6.0	call
Quarterdeck	
DesqView 286 / DesqView 386 v2.4	79/125
DesqView / X	165
Qemm 386 v6.0	62
Manifest / Qram 2.0	39/49
Quicken for DOS 6.0/ Mac/ Windows	45
QuickBook	87
QuickBook & QuickPay	110
QuickPay (payroll)	39
Speedstor 6.5	61
Speedstor Plus w/ SCSI controller	75
SpinRite II	60
Stacker Data Compression 2.0	89
Stacker AT/16	179
Superstor	79
The Far Side (computer calendar)	45
Time Slip v.5.0	189
Wave for Window	79
Winfax Pro	75
XTree Gold 2.5 / for win	89/42
Educational / games	on sale now
Microsoft Press Books	**$5 each**

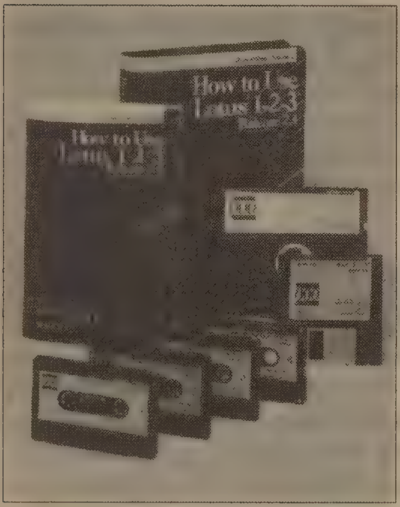
New Products

TRAINING

LEARN PC VIDEO SERIES

The Learn PC Video Series is a comprehensive, self-paced training system that combines videotapes, guidebooks, and an exercise disk to teach students how to use a variety of software applications. The Video Series currently includes training for Computer Literacy, DOS, WordPerfect, Lotus 1-2-3, dBASE, and most of the popular Windows applications. Targeted to high schools, career schools, and colleges, the Learn PC Video Series offers instructors a cost-effective, multimedia teaching methodology. Simon & Schuster, Inc., 1230 Avenue of the Americas, New York, NY 10020. (212)698-7000.

HOW TO USE LOTUS 1-2-3, RELEASE 2.4



How to Use Lotus 1-2-3, Release 2.4 is an interactive audio course designed to help both novice and experienced users make the most of Lotus 1-2-3's new graphical user interface. Users are introduced to the world of SmartIcons, WYSIWYG, and mouse control in working with 1-2-3 spreadsheets. The course is presented on four audiocassettes using FlipTrack's patented format. At selected points in each lesson, users can branch to optional topics or get extra practice by flipping the tape. Also included is a comprehensive Quick Reference Guide, summarizing key course concepts, and a Data Disk with realistic practice files. ($145) FlipTrack OneOnOne Computer Training, 2055 Army Trail Rd., Suite 100, Addison, IL 60101. 1-800-424-8668.

NETWORKING SOFTWARE

SILVERNET 2.1 PEER-TO-PEER NETWORK

The SilverNet 2.1 Peer-to-Peer Network Operating System for IBM PCs and compatibles features

Continued

PRODUCT UPDATES

➤**DacEasy** released **DacEasy Accounting, Payroll, and Point of Sale v4.3**. DacEasy, Inc., 1790 Preston Rd., Suite 800, Dallas, TX 75252. 1-800-DAC-EASY.

➤**Deneba Software** announced the **upgrade** to **Big Thesaurus 2**. System 7 savvy, Big Thesaurus is a System Extension offering a complete, online electronic thesaurus for the Macintosh. Deneba Software, Inc., 7400 S.W. 87th Ave., Miami, FL 33173. (305)596-5644.

➤**Fifth Generation** released **Fastback Plus Mac 3.0**, the first major revision to its backup program since v2.6 was introduced ten months ago. Registered users of any previous version can upgrade for $30. Fifth Generation Systems, Inc., 10049 N. Reiger Rd., Baton Rouge, LA 70809. (504)291-7221.

➤**OWL International** released **GUIDE Professional Publisher v2.0** a hypertext-based publishing system that converts existing print and online documents for electronic distribution and display. OWL International, Inc., 2800 156th Ave. S.E., Bellevue, WA 98007. (206)747-3203.

➤**P.I.M., Inc.**, released **Info-Mation 1.1**, its personal information management software for the Macintosh. Personal Info-Mation Management, Inc., 555 Pierce St., Suite 5, Albany, CA 94706. 1-800-444-4PIM.

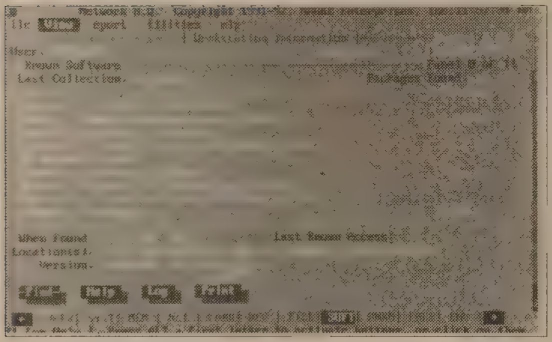
➤**Software Publishing** announced **Harvard Draw for Windows 1.01** that incorporates Adobe Type Manager, support for TrueType and Type 1 fonts, and includes thirteen new Adobe Type 1 fonts. Current uses can obtain the v1.01 update kit for a $15 shipping and handling fee. Software Publishing Corp., 3165 Kifer Rd., PO Box 95483, Santa Clara, CA 95056-0983. (408)988-7818.

➤**Strategic Mapping** introduced **Atlas Pro 1.5**, a major upgrade to its geographic information management system for the Macintosh. The new version adds more extensive connectivity to databases, improved street-level mapping and address matching, and new tools for zooming the map. Free upgrade for registered users. Users of Atlas MapMaker can trade up to Atlas Pro for $249 until December 31, 1992. Strategic Mapping, Inc., 3135 Kifer Rd., Santa Clara, CA 95051. (408)970-9600.

➤**Traveling Software** introduced **LapLink Pro Release 4**, the newest version of its file transfer utility. The upgrade will be available for the first time through the retail outlets. Traveling Software, Inc., 18702 N. Creek Pkwy., Bothell, WA 98011. (206)483-8088.

SilverEMAIL, SilverCHAT, Interoperable SilverMESSAGE, and improved performance while maintaining its low memory overhead. In addition, SilverNet is compatible with Windows 3.1 and all versions of DOS—MS-DOS, PC DOS, and DR DOS. SilverEMAIL allows users to quickly send and receive email over the network. Mail is read directly from the DOS Net Menu program or through the Windows User Interface which is included with all SilverNet products. SilverCHAT is a messaging interface that communicates in real time. SilverMESSAGE allows pop-up messages to be sent to all users with a general broadcast or targeted to a specific user. ($99 per node. Free upgrades are available for users who purchased SilverNet after January 1992. Products purchased prior to January 1992 can be upgraded for $50 per network) Net-Source, Inc., 1265 El Camino Real, Suite 101, Santa Clara, CA 95050. (408)246-6679.

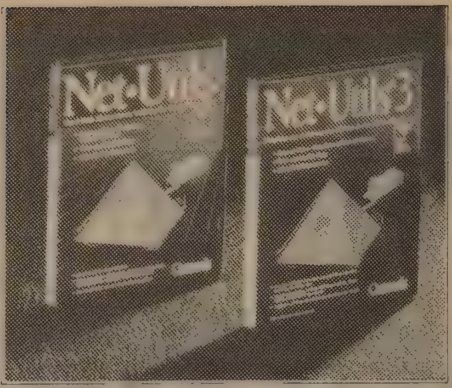
NETWORK H.Q. 2.5



Network H.Q. is designed to automatically inventory LAN workstation configurations. Previous versions have been NetWare specific, but v2.5 will operate on NetWare, LAN Manager, VINES, and most NetBIOS-, NDIS-, or ODI-compatible networks. The new version includes such information as CPU clock speed and MCA and EISA adapter card information. It will report workstation environments such as Windows, DESQview, OS/2, ROM BIOS manufacturer and version, and NETBIOS version and Bus type. Further, Network H.Q. will report the specific model of 163 of the most popular personal computers. It will also track Macintosh computers connected to a network. (100-pack server license, $395) Magee Enterprises, Inc., 2909 Langford Rd., Suite A600, Norcross, GA 30071-1506. (404)446-6611. MCI: MAGEE.

ONTRACK NETWARE CERTIFICATION

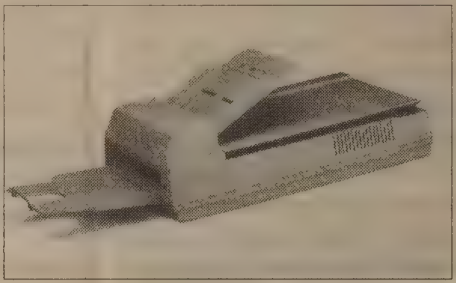
Ontrack Computer Systems received Novell certification of its two NetUtils data recovery and protection utilities for NetWare 2.x and 3.x file servers, and of NetOptimizer 2 data organization software for NetWare 2.x file servers. NetUtils 2 and 3 are collections of expert hard drive utilities providing complete preventative maintenance and data recovery software for NewWare network file servers. The NetOptimizer 2 software utility is designed to increase drive performance and productivity through defragmenting files and organizing volumes contained on the user's NetWare 2.x file server. (NetUtils 2 retails at $124.95. NetOptimizer 2 and NetUtils 3 are $395 each) Ontrack Computer Systems, Inc., 6321 Bury Dr., Eden Prairie, MN 55346. 1-800-752-1333.



PC HARDWARE

SIIG AV800 DOCUMENT SCANNER

The AV800 Document Scanner is a high-speed flatbed scanner supporting three types of scanning: 24-bit color, 8-bit grayscale, and black-and-white scanning. It features a fast scanning speed (up to 12 pages per minute) with a built-in 50-page automatic document feeder and includes IMS image editing software, as well as software drivers for most desktop publishing, optical character recognition, and document image processing software programs. ($2495) SIIG, Inc., 6078 Stewart Ave., Fremont, CA 94538-3152. (510)657-8688.



COMPUTER IN A KEYBOARD

The PC-101 is a complete 33MHz, 386 computer system with all peripherals and components installed within a 101-key style keyboard. This "Computer-in-a-keyboard" provides a slot for an 8/16-bit network card. This allows the unit to operate as a LAN workstation or as a standalone computer. There are external ports for a PS/2 mouse interface, as well as a bar code reader, scanner or light pen, and floopy or tape drives. Internally, there is an FDD controller with a 1.44MB floppy drive and an IDE HDD controller. The 386SX system features 1MB of RAM, expandable to 16MB. ($1495) DataBusiness Systems, (714)252-0990.

SCANMAN COLOR

ScanMan Color is a 24-bit color hand-held scanner for the Windows environment. With 24-bit capacity, this scanner is able to capture true 256 grayscale data, in addition to its 16.8 million colors, without the need to convert color information into grayscale. It also features a proprietary white fluorescent light that permits consistent scanning brightness without a warm-up period. ScanMan Color is bundled with FotoTouch Color Image Editing Software. A key component of FotoTouch is Logitech's AutoSwitch capability, a feature which automatically "deskews" each scan, locates matching features, extrapolates to fill in missing pixels, and decalibrates color across the entire finished image. ($699) Logitech, Inc., 6505 Kaiser Dr., Fremont, CA 94555. (510)795-8500.

EVEREX NEW 486 STEP SYSTEMS

The Everex STEP Megacube is based on the Intel 486 DX2 66MHz CPU. Utilizing Intel's speed doubler technology, the system runs at 66MHz while the bus speed remains at 33MHz. Based on a 32-bit EISA bus, the STEP Megacube provides transfer speeds of up to 33MB/second for high-end applications that require fast data I/O throughput. The Megacube is ideal as a file server in large network installations. Housed in a cube-shaped chassis, it is designed for customers requiring a high degree of expansion and upgradability. The system supports twelve expansion slots; up to eight half-height, 3.5" drive bay configurations; and 64MB of memory. Featuring a mechanical design capable of operating in the most demanding commercial environments, the Megacube is compartmentalized so that the processor and hard drives are separated and cooled by two variable-speed SmartFans that route air

Continued

BEST CUSTOMER SERVICE! BEST QUALITY! BEST PRICES!

MICRONICS

486-50/DX2-50/33 / EISA

$1895/1545/1485

486-50/ 486-33 / ISA

$1595/$1135

- 8K Byte Cache & Floating Point Unit
- 256K Second level Cache
- 4MB RAM expandable to 64MB
- 1.2MB Teac or 1.44MB floppy drive
- IDE Controller & 2S,1P,1G ports
- 101 Keyboard
- Desktop case with 230W power supply

MCC-USA CAD/CAM/GRAPHICS SUPER WORKSTATION

$3380

486-33MHz

$3050

- 486-50MHz ISA Mother board, made in U.S.A.
- 256K cache
- 8MB RAM (60ns)
- 1.2M and 1.44M Teac Floppy drive
- MAXTOR LXT-213SY SCSI H/D,15MS
- Fast Cache SCSI Controller w/4MB
- ORCHID Fahrenheit 1280 VGA card w/1MB
- NEC 4FG(1024x768 non-interlaced)
- Big tower case w/250w Power supply w/486-COOLER
- 2S, 1P, 1G ports * Mitsumi or KeyTronic 101 Keyboard
- Logitech Mouseman BUS or Miceosoft 400PPI BUS mouse

OPTIONS:

NEC 3FGx 15" 0.28 1024X768	-$90
Viewsonic V-7 17" 0.28 1280x1024 non-int	+$325
Sony 1604S 16" 0.25 1024x768 non-int	+$310
Mitsubishi FS-6605ATK 16" 0.28 1024x768 non-int	+$200
Sony CPD-1304S 14" 0.25 1024x768 non-int	-$190
Adaptec 1542B SCSI Controller	-$20
OPTA Monalisa TI34020 4MB VRAM 24-bit color	+$1295
Fujitsu M2622 330MB 12ms SCSI	+$375
Fujitsu M2624 520MB 12ms SCSI	+$500
Maxtor P0-12s 1.02GB 13ms SCSI	+$1230

5 YEARS LABOR AND 1 YEAR PARTS WARRANTY

486-50/33 ISA

$955/745

- 64K cache
- 1MB RAM expandable to 32MB on board
- Teac 1.2 MB or 1.44 MB drive
- IDE controller (2FD/2HD)
- 2 serial & 1 parallel ports
- AT case with power supply
- 101 keyboard

MCC-USA 486DX-50 EISA *SUPER WORKSTATION*

- 486DX-50 EISA Motherboard, Made in U.S.A.
- 256K Write Back Cache up to 512K, 8MB RAM Epd up to 128MB on board, Adaptec1742 EISA SCSI controller

### OTHER PARTS ARE THE SAME AS THE ISA SUPER ### WORKSTATION LISTED ON THE ABOVE COLUMN

$3895

MPC

$525

W/SYSTEM PURCHASE

UPGRADE TO MULTIMEDIA PC, COMPLETE HARDWARE & SOFTWARE PACKAGE

386-33MHz System

- 1MB RAM
- 1.2MB or 1.44 MB floppy drive
- IDE Controller (2F/2H)
- 2S, 1P, 1G
- AT case with power supply
- 101 keyboard

386-40MHz 64K Cache $470

386SX-25 $385

$460

PROFESSIONAL HARDWARE AND SOFTWARE TECHNICAL SUPPORT

MONTHLY SPECIALS

- 486-COOLER for 486-33/50/66 Microprocessors (Overheat will make CPU die, system hangs, data transfer error) $25.95
- Supper New Hard Drive Specials:

FUJITSU M2624FA/520MB,SCSI,3.5",12MS	$999.00
CONNER CP3540/540MB,SCSI-I&II,3.5",12MS	$899.00
CONNER CP3544/540MB,IDE,3.5",12MS	$899.00
MAXTOR LXT340S/340MB,SCSI,3.5",15MS	$750.00

- 3.5" DTL Floppy Diskettes: 100% Certified Error Free 10pcs/box DS/HD $7.90 DS/DD $5.50

MOTHER BOARDS

MICRONICS

486-50 EISA&LOCAL BUS /256K	$1545
486-50 ISA W/256K CACHE	$1245
486-33 EISA&LOCAL BUS /256K	$1135
486-33 ISA W/64K CACHE GCP	$785
386-33 64K CACHE GCP-ASIC	$430

MCC-USA

486DX-50 EISA W/64K CACHE	$1195
486DX-50 ISA W/64K CACHE	$795
486DX-33 ISA W/64K CACHE	$570

ORCHID

486DX-50 ISA LOCAL BUSw/64K w/1280-D/1MB/32K colors	$1225
486DX-33 ISA LOCAL BUSw/64K w/1280-D/1MB/32K colors	$1105

GENOA

486DX-50 ISA LOCAL BUSw/64K w/L.B. 24-bit true color VGA card (showing 16.7million colors)	$1025
486DX-33 ISA LOCAL BUS w/64K w/L.B. 24-bit true color VGA card	$885

OTHERS

486DX-50 ISA W/64K CACHE	$715
486DX-33 ISA W/64K CACHE	$540
386DX-40 ISA W/64K CACHE	$255
386DX-33 ISA W/64K CACHE	$250
386SX-25 ISA, W/CPU	$145

MONITORS

NEC

6FG 21", 0.28, 1280X1024 NI	$2055
5FG 17", 0.28, 1280X1024 NI	$1295
4FG/3FGx 15".28,1024X768	$769/685

SONY

1304S 14" 1024X768 NI, 0.25	$579
1604S 17" 1024X768 NI, 0.25	$1045

MITSUBISHI

FS6605ATK16",0.28,1024X768	$975

NANO

T550i 17", 1280X1024	$1095

VIEWSONIC

V-8 20" 1280X1024 NON-INT	$1625
V-7 17" 1280X1024 NON-INT	$1080
V-6E 14"102468 NI, 0.28	$365
V-4E 14" 1024X768, 0.29	$320
V-2 14" 640X480, 0.28	$290

VIDEO CARDS

ORCHID FAHRENHEIT 1280 W/1MB, W/SIERRA,72Hz,32k colors	$235
ORCHID PRO-DESIGNER IIS W/1M W/SIERRA,72Hz,32k colors	$145
DIAMOND STEALTH 1280 W/1MB W/SIERRA, 72Hz,32k colors	$235
DIAMOND SpeedStar w/1MB	$145
ATI Graphics Ultra 1MB w/mouse	$395
GENOA 7900 Multimedia VGA 16million colors, 72Hz,w/1MB	$159
TRIDENT 1024X768, W/1M	$85
GENERIC SVGA 1024 W/512K	$65
GENERIC VGA 800X600 W/256K	$45

I/O CARDS

2S,1P,1G	$20
SUPER I/O w/256K baud serial port	$42

TAPE BACK-UP

COLORADO

DJ-10 (40,60,120MB)	$205
DJ-20 (250MB)	$279

LASER PRINTERS

HP LASER

IIP+/IIIP/III (W/TONER)	$795/999/1485

MEMORY CARD FOR IIP+,III,IIIP,IIID
1M $85, 2M $120, 3M $162, 4M $205

HARD DISK DRIVES

CONNER

CP-3000 IDE 40MB 28MS	$205
CP-30104 IDE 120MB 19MS	$325
CP-30204 IDE 212MB 16MS	$455

SEAGATE

ST-157A IDE 40MB 28MS	$205
ST 4766N SCSI 670MB,16MS	$1295

MAXTOR

XT7080A 80MB 17MS IDE	$275
XT7120A 120MB 15MS IDE	$330
XT4170E/S 154MB 14MS	$595
XT7213A 213MB 15MS	$455
LXT213 213MB 15MS IDE/SCSI	$550

FUJITSU

M2622 IDE/SCSI3.5"330M,12MS	$950
M2266 SCSI, 51/4" 1.2GB,16MS	$1925

QUANTUM

LPS52 IDE/SCSI 52MB,19MS	$235/255
LPS120 IDE/SCSI 16MS	$365

FLOPPY DRIVES

TEAC 1.2MB 5.25"	$62
TEAC 1.44MB 3.5"	$60
TEAC 2.88MB 3.5"	$115
TEAC 1.2MB & 1.44MB 2-IN-1	$139

DRIVE CONTROLLERS

DTC

6282-24 ESDI 24Mbit/SEC,2F/4H	$165
3280 SCSI 7HD/2FD	$125
3290 AS SCSI EISA 7HD/4FD With 1MB/4MB	$545/665

ULTRASTOR

ULT 12F ESDI w/32K cache	$165
ULT-22C EISA ESDI w/1M up 16MB, 33Mb/s	$665
ULT-14F SCSI I&II 10MB/S	$245
ULT-24F SCSI I&II 33MB/S EISA	$495

CSC

FASTCACHE-64 IDE 2H4F 1MB	$195
FASTCACHE-64 SCSI 7H4F 1MB	$295

UP TO 64MB CACHE W/Regular SIMM, Near Zero Access Time

ADAPTEC

1542B/BK KIT SCSI	$249/$269
AHA-1742/Kit EISA SCSI	$470/499

IDE CONTROLLER & OTHERS

IDE CONTROLLER W/2FD&2HD	$22
IDE CONTROLLER W/4FD&2HD	$45
SPECIAL IDE CONTROLLER works with MFM,ESDI,SCSI cards	$55

MODEMS

24/96 FAX MODEM (S&R) INTL	$95
24/96 F/MODEM (S&R)EXT MNP5	$149
2400 INTL MODEM	65
GVC144/144 F/MODEMV.32/42 Inl	$285

CD-ROM & BLASTER

SONY CDU 53511 INTL BUS kit	$345
SONY CDU 54101 INTL SCSI kit	$525
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SONY CDU 7211 EXTL SCSI kit	$635
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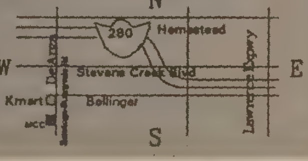


through the system. Everex Systems, Inc., 48431 Milmont Dr., Fremont, CA 94538. (510)498-1111.

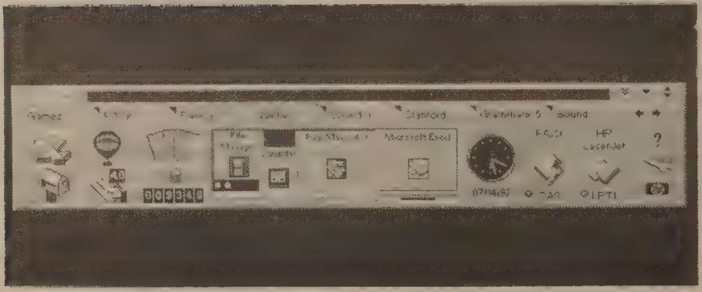
RADIANT RAD-1 386SX-20

The RAD-1 is a fully integrated personal computer designed to satisfy the needs of the unsophisticated user. It comes preloaded with over 30MB of software, including Windows 3.1, Quicken accounting software, WinFax, PFS Windows Works (an integrated word processing, chart editor, spreadsheet, database, address book, and label maker), and popular educational games. For all users, RD-1 offers plenty of power and expandability. The system is designed around a 386SX processor with an 80MB hard drive, 4MB of RAM, 14" Super VGA color monitor, 1.44MB 3.5" disk drive, Sound Blaster sound card, external speakers, 101-key keyboard, three-button mouse, joystick, and internal send and receive fax modem. ($2700) Radiant Computer Technology, Inc., 8310 Capital of Texas Highway, Suite 300, Austin, TX 78731. (512)794-0086.

PC SOFTWARE

HP DASHBOARD FOR WINDOWS

Dashboard is a convenient, push-button utility panel that provides users with a much faster way to work in Windows. Appearing at the bottom of a user's screen, Dashboard features a series of controls for multiple-screen views of programs and push-button icons to launch applications and organize program groups. It includes printer/fax output controls and gauges to monitor system resources and memory. Dashboard is customizable so users can choose the size and configuration of features to best fit their needs. ($99) Hewlett-Packard Co., 3000 Hanover St., Palo Alto, CA 94304. (408)447-7280.



PC PUBLISHING SUCCESS

Success is an integrated add-on package that takes data and graphics directly from any Lotus 1-2-3 worksheet to create slides, overhead transparencies, speaker notes, or hand-outs. And, any changes to the worksheet are automatically incorporated into the presentation. With Success's viewer windows, users can preview any operation at any time. They can gauge the effect of formatting options before implementing as well as preview files before importing them. This highly intuitive program combines DOS speed with a graphical interface, including pull-down menus, dialog boxes, and resizable windows.($159.95) PC Publishing, Inc., 58 Charles St., Cambridge, MA 02141. (617)225-2570.

PEACHTREE CLIENT WRITE-UP, V5.1

Peachtree Client Write-Up allows accountants to transform their client's bookkeeping efforts into professional financial statements and reports. This new version supports Windows 3.1 and TrueType fonts, with a WYSIWYG environment that enables accounting professionals to produce impressive, typeset-quality statements and reports. Client Write-Up offers features not typically found in accounting system general ledgers: financial report writing, after-the-fact payroll, customizable formulas, and dynamic data exchange permitting hot links with other Windows applications. ($399) Peachtree Software, Inc., 1-800-554-8900.

MACINTOSH HARDWARE

PLI 120MB DRIVES FOR POWERBOOKS

The PLI 120MB 2.5" TURBO internal hard disk offers safe, reliable storage for the Macintosh PowerBook 140 and 170. It features low power consumption and power-saving sleep and standby modes that conserve power when the drive is not in use. This durable, small 4.8oz. drive is very shock resistant—designed to withstand up to 100 g's. Firmware performs automatic diagnostic testing at power-up. PLI includes a 1-year warranty, toll-free support, and online technical support through PLI's BBS or AppleLink. ($999) Peripheral Land Inc., 47241 Bayside Pkwy., Fremont, CA 94538. 1-800-288-8754. AppleLink: D0495.

TWINSLOT LC

The Sonnet TwinSlot LC is a two-slot adapter for the Mac LC and LC II computers. The standard Mac LC and LC II have only a single slot and limit the user to one PDS enhancement. Many of these enhancement cards include accelerator cards and input/output cards such as Ethernet, Token Ring, and large-screen videocards. The sonnet TwinSlot LS allows the addition of both a fast accelerator card plus an I/O card, thereby transforming a low-cost Mac LC into a high-performance workstation. The Sonnet TwinSlot LC includes a two-slot adapter card, a new Mac LC/LC II chassis top, and a larger capacity power supply. ($549) Sonnet Technologies, Inc., 18004 Sky Park Circle, Suite 260, Irvine, CA 92714-6428. (714)261-2461.

MACINTOSH SOFTWARE

LOTUS CC:MAIL FOR MACINTOSH 2.0

cc:Mail for Macintosh 2.0 features the Message Finder, a powerful message searching capability that lets users quickly find information and easily share it with other Macintosh users and with users of MS-DOS, Windows, and OS/2 versions of cc:Mail. With this feature users can search their inbox, folders, archives, or bulletin boards by

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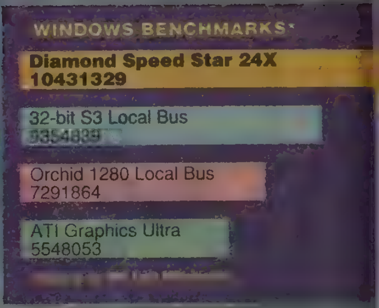

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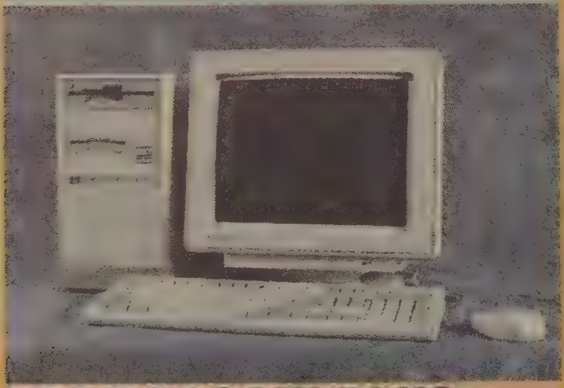

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- 64KB Cache
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- 105 MB IDE Hard Drive
- TEAC 1.44 and 1.2 MB FLoppy Drive
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- 16 Bit super VGA card
- BTC 101 Enhanced Keyboard
- 2 serial, 1 parallel, 1 game ports
- 8 expansion slots
- Deluxe Mini Tower case with digital display
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- 210 MB IDE Hard Drive
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- Diamond SpeedSTAR24X True-Color Window Accelerator with 16 Million Colors
- Maxi-Switch 101 Enhanced Keyboard
- 2 serial, 1 parallel, 1 game ports
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- DOS 5.0, WINDOWS 3.1 & Mouse

Intel 486DX-33	$2140
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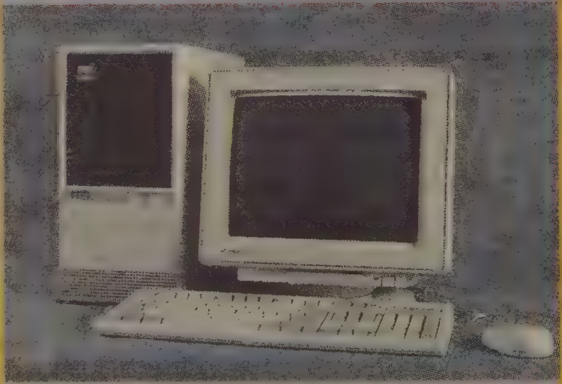

486 TRUE COLOR

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- 14" 1024NI SVGA Monitor
- Diamond SpeedSTAR24X True Color Windows Accelerator w/16 Million Colors
- Maxi-Switch 101 Enhanced Keyboard
- 2 serial, 1 parallel, 1 game ports
- 8 expansion slots
- Deluxe Mid Tower case with 2 fans
- DOS 5.0, WINDOWS 3.1 & Mouse

Intel 486DX-33	$1700
Intel 486DX-50	$1900

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- 8 MB 70 ns RAM expandable to 64MB
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- AWARD BIOS
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- TEAC 1.44 & 1.2 MB FLoppy Drive
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- Diamond SpeedSTAR24X True-Color Window Accelerator with 16 Million Colors
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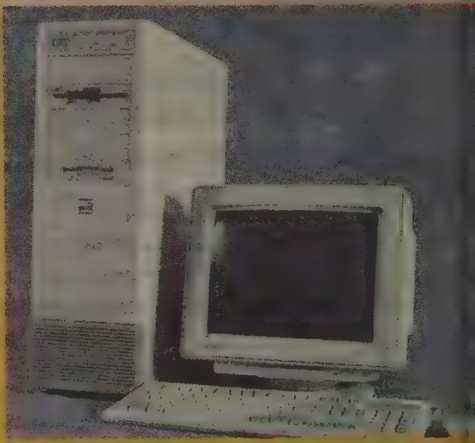

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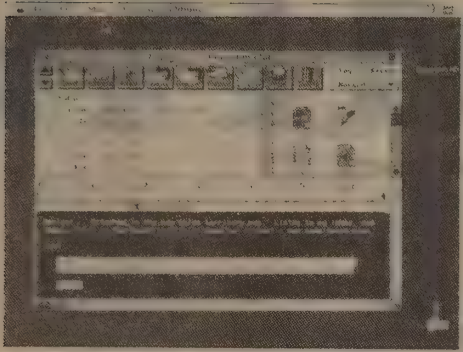


a variety of criteria, such as subject, text content, author, date, priority, or message contents. Version 2.0 also offers cross-platform application association whereby users can instantly open attachment files created in MS-DOS or Windows from within cc:Mail if the corresponding Macintosh application is present. Users can also open and print attachments created by any application that supports Apple's XTND file translator, even if the application is not present. ($495 per post office, a ten-user pack is $345, a twenty-five-user pack is $845) Lotus Development Corp., 55 Cambridge Pkwy., Cambridge, MA 02142. (617)577-8500.

REVIEWS

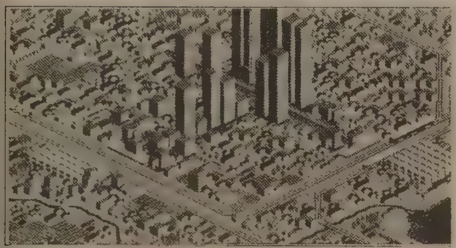
GAMES

By Mike Markowitz

A-TRAIN

Designed By: Artdink (T. Nagahama, H. Kanda, S. Sako, et al.)
Published By: Maxis
For: MS-DOS (12MHz or faster; 640K, VGA or EGA graphics, mouse recommended, supports most audio cards) Macintosh and Amiga versions scheduled for release later in 1992
List Price: $69.95

A-Train was orginally developed in Japan, where three successive versions were big hits on several different home computer systems. Maxis bought the rights from Artdink to do an Americanized version. This "software toy" operates on three levels. First, you design and manage a railroad. Second, you develop a city around your rail system. Third, you have to build a financial empire by dealing in real estate and stocks. Much more than a choo-choo simulator, A-Train is sort of like SimCity for capitalists.



Your empire consists of a vast plain with scattered settlements and an existing rail line that connects to the outside world. You can choose any of six different regions, each presenting a different set of problems. The main display shows a small section of your world, using an isometric projection to create a three-dimensional illusion of depth and perspective. You can also bring up a "satellite view" window that shows a map of the entire region. The simulation cycles through day and night and through the seasons of the year—you can speed up or slow down the clock rate.

Menu options allow you to lay tracks, buy and schedule

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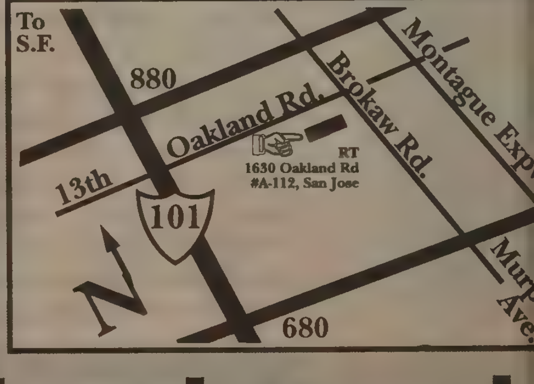

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trains, buy or sell land and develop commercial and residential properties.

Graphics and Animation: 9
Sound: 7
User Interface: 7
Overall Play Value: 8

Trains may be passenger or freight, there are nineteen different types from which to choose. The program provides an extensive array of financial reports and balance sheets to let you know how you are doing, but there is no way to print out this data for off-line reference (unless you use a screen capture utility).

A-Train is a very deep and complex simulation, but you are not completely helpless. From time to time, "advisors" will pop up on the screen to offer suggestions or correct your mistakes.

The train types are Japanese, as are some nice little details, like the red-crowned cranes you can see when they fly south in October and north in April.

The illustrated 140-page manual includes an elaborate Tutorial to teach you the basics, a complete Reference section, and a nice little history of railroading. There are also bits of railroad slang, songs, and stories.

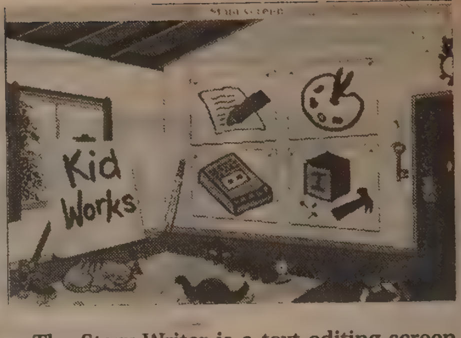
A-Train is too complex for casual entertainment, but it should appeal to fans of SimCity as well as railroad buffs.

KIDWORKS 2

Designed By: Cathy Siegel and Dori Friedman
Published By: Davidson
For: Macintosh (SE or later CPU, color or monochrome, 2MB for System 6.07, 4MB for System 7)
List Price: $59.95

One of the most important things in the design of educational software is creating a sense of wonder for the user. KidWorks 2 meets this requirement with a very smooth implementation of text-to-speech processing. There is still something magical about hearing a computer speak the words you write. This is an old trick on the Macintosh—the Macintalk text-to-speech application was introduced in 1984 with the original 128K Mac.

KidWorks 2 is aimed at ages four to ten, but includes painting and writing tools that could easily appeal to older users. The opening screen is a room filled with animated toys (a shameless clone of the concept in Brøderbund's *Playroom* and *Treehouse*). An easel holds pictures that represent the program's four modules or activities: Story Writer, IconMaker, Story Illustrator, and Story Player.



The Story Writer is a text editing screen with about five lines of large text (the default font is 36-point KidText, based on traditional classroom standard letterforms, but you can choose any other 18- or 36-point font on your system). About 250 common nouns, verbs and adjectives can be represented by icons—you can toggle the display between plain text and text mixed with the picture icons. Click on the speech button and the program will take a shot at voice output of whatever you have written. The IconMaker lets you add your own word pictures to the program's vocabulary, you can even specify how they should be pronounced, since the speech synthesizer may guess wrong on the phonetics of an ambiguous spelling.

Story Illustrator is a paint program with a standard set of tools plus a few special effects and a set of "stamps" (small graphic objects like trees, arrows and animals). There are eleven ready-made background pictures (forest, city, castle, beach, desert, etc.).

Continued

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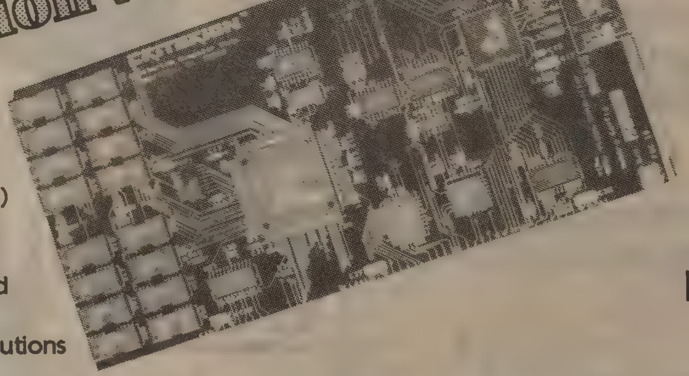

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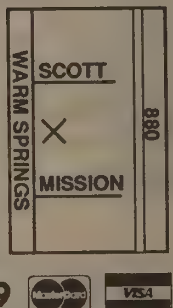

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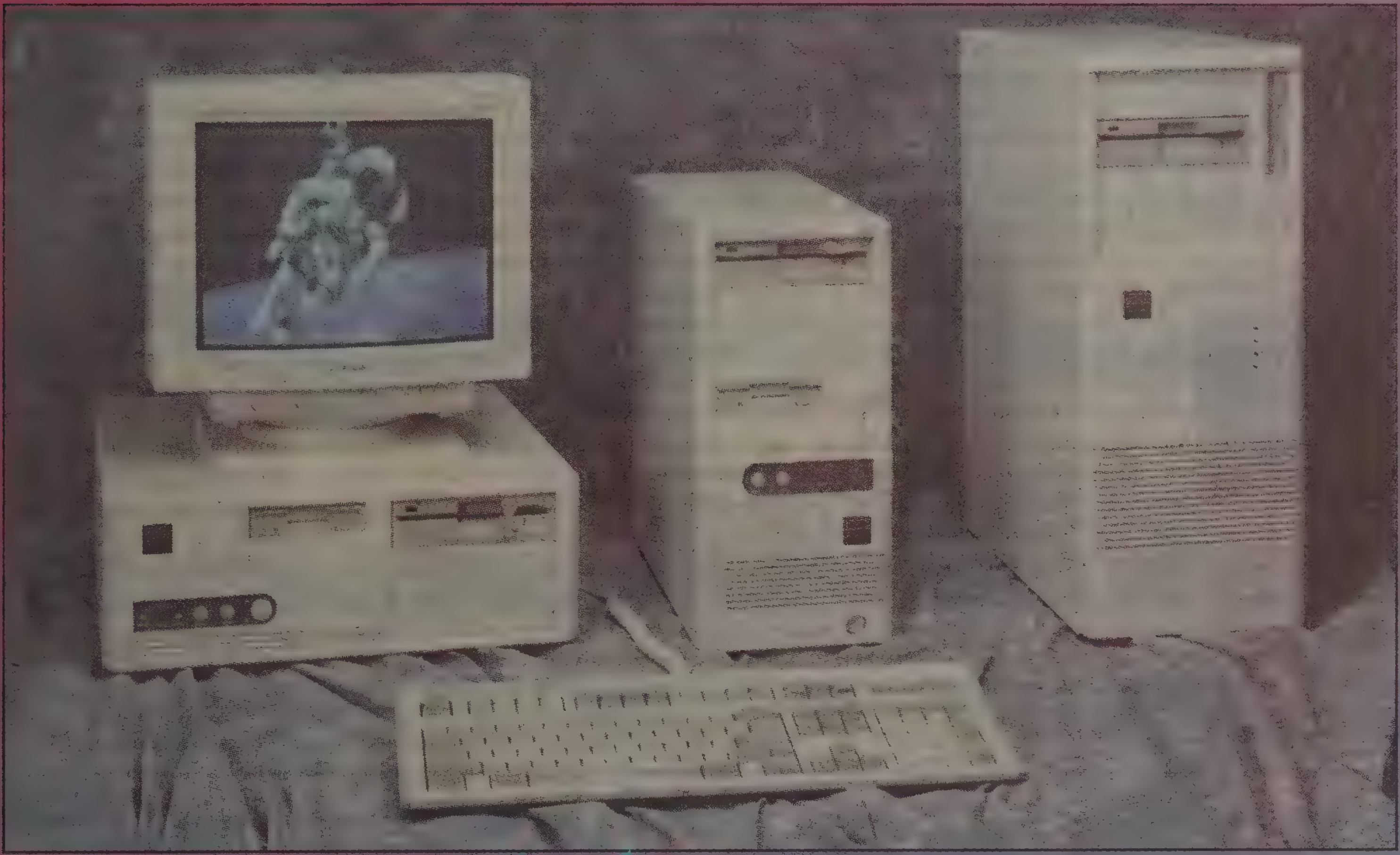

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Depending on your color video mode, the Story Illustrator provides either sixteen or sixty-four colors. Any picture can be saved to the Picture Box, and inserted into a story in the Story Writer (where it appears as a thumbnail view). In the Story Player your pictures appear in full size, with two lines of text underneath. The Story Player uses the metaphor of an audio tape player, you can start, stop, pause, rewind or fast-forward through the sequence of text and pictures

A lot of thought went into the KidWorks 2 user interface. Standard Macintosh dialog boxes have been replaced with graphic icons, and a Talking Help feature lets you hear the explanations as you read them. The program can import PICT files. A Child Safety Mode prevents the littlest users from accidentally quitting the program or getting lost in the Finder. A Sign-In option creates individual personal folders for each child who uses the program. The program supports color output on color-capable printers.

Graphics and Animation: 8
Sound: 8
User Interface: 9
Overall Value: 8

KidWorks 2 requires at least 2MB of free hard disk space. The program is easily installed from three 800 K floppy disks. I had no trouble running the program on a Mac PowerBook 100. There is an illustrated 44-page user manual.

VIDEO POKER FOR WINDOWS

Designed By: Roger Gilbertson and James Michael
Published By: Masque Publishing
For: Windows 3.0 or later; supports Multimedia PC audio standard
List Price: $54.95

Video Poker has become one of the most popular games in the casinos of Las Vegas and Atlantic City. Unlike slot machines or pure games of chance, it involves a considerable element of skill. You gotta know when to hold 'em, know when to fold 'em, etc.

The game is quite simple. You place an initial bet of one to five coins, and then five cards are dealt. You may discard any of these, and then draw to obtain your final hand. The machine evaluates this hand to determine the payout, if any. Different payout tables are used in different versions of the game, so the first element of strategy is knowing which machines to play.

Video Poker for Windows is, in effect, a poker machine simulator and trainer, enabling the would-be high-roller to practice, practice, practice, without risking real money. The aim is to develop an intuitive feel for the average payout or "expected value" of any hand. Leonard Frome, who developed the strategies used in the program, is billed as a math instructor at the University of Nevada and consultant to manufacturers of gaming equipment.

Graphics and Animation: 6
Sound: 7
User Interface: 8
Overall Play Value: 6

The package includes both 5.25" and 3.5" disk formats, and is easily installed from Windows' Run... dialog box. The program takes up about 500K of disk space after installation. The Windows implementation is very well done; the program uses scalable fonts; you can shrink the game window to a quarter of the screen, launch four instances of the program, and play four games at once, if your system has enough RAM.

The very good Online Help follows the standard Windows format. The 91-page pocket-sized manual includes the following disclaimer:

> *This product is not intended to encourage or approve of gambling, except as a form of entertainment. Masque Publishing and Leonard Frome the strategy author, believe that Video Poker machines rely solely on the*

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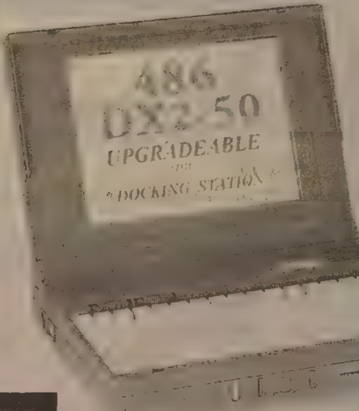

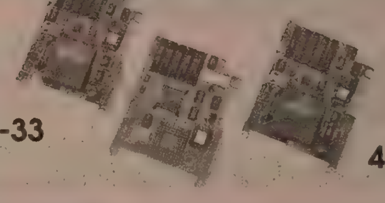

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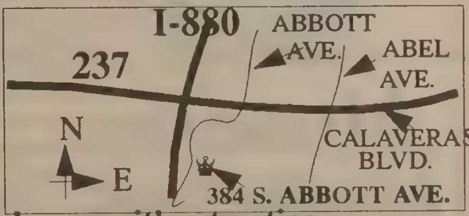

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SNOOPY'S GAME CLUB

Designed By: Gónene Smith and Mike Berlyn
Published By: Accolade
For: MS-DOS (640K, MCGA, EGA or VGA graphics, 10+ MHz processor and mouse recommended, popular audio cards supported)
List Price: $49.95

The Peanuts characters created by cartoonist Charles Schulz over thirty years ago have contributed their wholesome and gentle irony to the marketing of every imaginable product and service. Poor Charlie Brown, Lucy, Linus, Snoopy, and Woodstock even try to sell us life insurance. So it should be no surprise that Accolade (the entertainment software powerhouse) has inked a multi-year licensing deal with United Features Syndicate (the corporate giant that controls your favorite imaginary characters), for a line of kid-oriented Peanuts software.

Despite the rumbling of Serious Money in the background, the first package in the series, Snoopy's Game Club, is an engaging and well-designed set of three very different games for ages 3–8 and beyond.

Charlie Brown's Picture Pairs is similar to the old TV game show *Concentration.* You choose a pair of hidden tiles to flip over. If the tiles match, they both go bouncing off the screen; if they don't match, they are hidden again, and you try to remember what went where. You can play with eight, eighteen, or thirty-six tiles, using either letters of the alphabet or pictures of the Peanuts characters.

Snoopy's Animated Puzzles is a remarkable little programming achievement. There are nine different animated scenes that can be scrambled into as many as sixty-four pieces. You have to put the puzzle back together by pointing and clicking while each piece continues to move. It's quite a challenge, and great fun.

Woodstock's Look-Alikes is similar to the pattern-recognition puzzles used in some intelligence tests. You are presented with up to eighteen cartoon characters, fish or tree leaves and you have to select the two that are identical. In each successive round the differences become more subtle, and you really have to study the graphics to find the key features.

Graphics and Animation: 8
Sound: 8
User Interface: 6
Overall Value: 8

Snoopy's Game Club provides good feedback and reinforcement to the player, but it is not always obvious what you are supposed to do. When the user may not know how to read yet, the software designer and programmer face a tough challenge creating on-screen controls, menus and Help. The program is not copy

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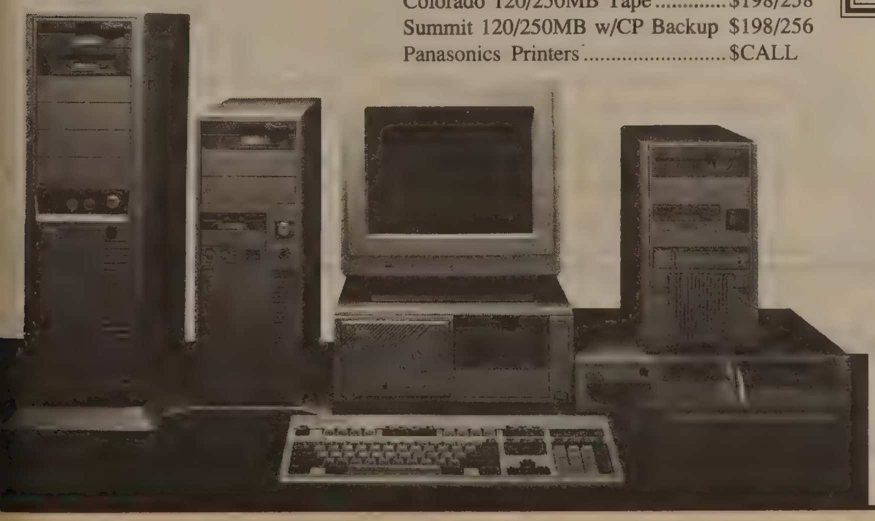

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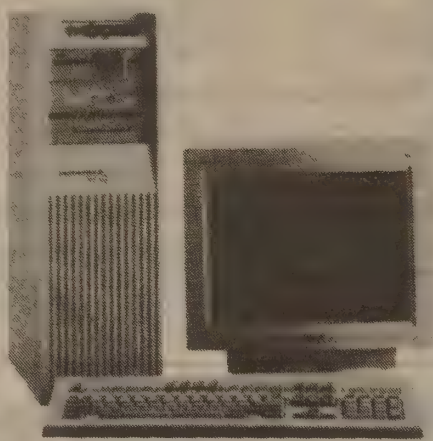

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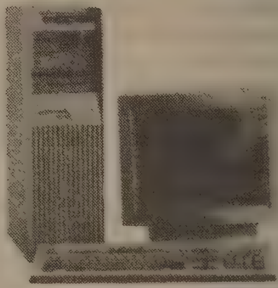

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Maxtor	7120A	125 MB	15 ms	1 year	309
Maxtor	7213A	213 MB	15 ms	1 year	469
Maxtor	LXT-340A	340 MB	15 ms	1 year	749
Fujitsu	M2622T	330 MB	12ms	5 year	899
Fujitsu	**M2623T**	**420 MB**	**12 ms**	**5 year**	**959**
Fujitsu	M2624T	520 MB	12 ms	5 year	1089
	SCSI hard drive				
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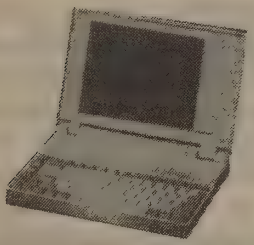

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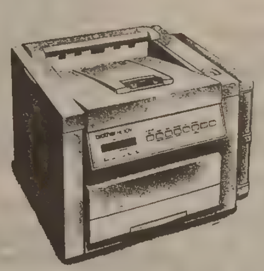

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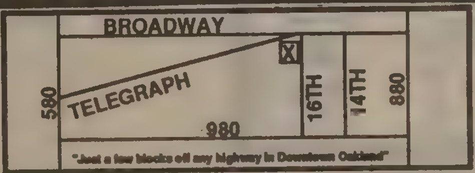

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PC SOFTWARE REVIEW

QUICKSCORE DELUXE

Published By: Dr. T's Music Software
List Price: $149
Reviewed By: George M. Skarpelos

All musicians with a smidgen of interest in computers have, at one time or another, pondered the incredible possibilities posed by the marriage of these machines with music. The arduous task of scoring a piece of music becomes as simple as typing into a word processing program. MIDI (Musical Instrument Digital Interface) lets you transcribe a keyboard part even if you do not read music; the software does all the transcribing for the user.

QuickScore Deluxe is a low-priced entry into the fast expanding PC music software market. It provides both scoring and sequencing functions in one program. QuickScore supports up to sixteen different tracks or staffs that can drive either internal FM synthesizers or outboard music workstations. The user can view entire scores by page or by track. QuickScore needs at least 540K of conventional DOS memory to run and a compatible sound card. Though it will run on an XT, the slow CPU speed can cause timing problems with auto-scrolling. Dr. T's Music Software recommends a 386 machine for trouble-free operation.

Generally, I found QuickScore lacking in several areas. In terms of notating and editing with the mouse, the interface was clumsy, barely intuitive, and inconsistent. Note ties would be created inadvertently and there was no drag and drop editing. It was impossible to insert a rest. While visually scrolling through the score during playback, the notes are not highlighted as they are played. The act of composition soon became quite frustrating.

As a sequencer it was acceptable, but traditional music notation is not always the most appropriate method for sequencing music. Though the interface was sharp and the response of the program was snappy, this software left quite a bit to be desired.

QuickScore Deluxe would be ideal for those musicians who own a modest PC and would like to occasionally transcribe an item or two. It would also appeal to those with a simple MIDI setup who would like to link their music hardware to their PCs. QuickScore would certainly facilitate some fundamental music education tasks, but as a notation/sequencing program the computer-literate musician would be better off looking at more powerful, and unfortunately, more expensive programs. (Dr. T's Music Software, 100 Crescent Rd., Needham, MA 02194. 617/455-1454)

AMI PRO 3.0

Published By: Lotus

Continued

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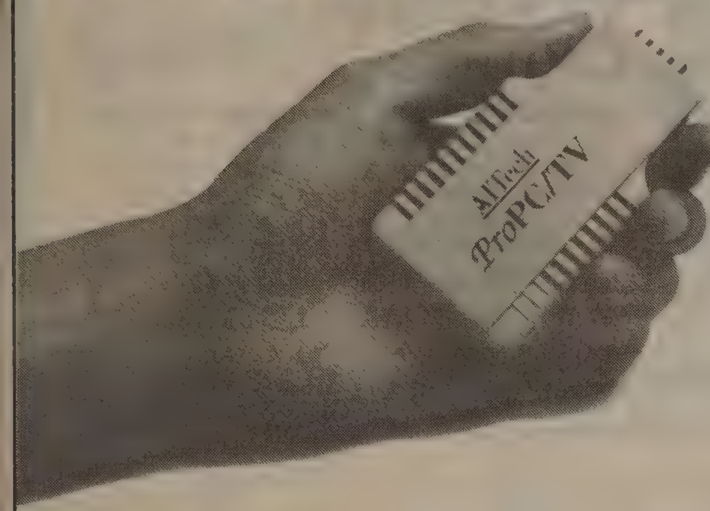

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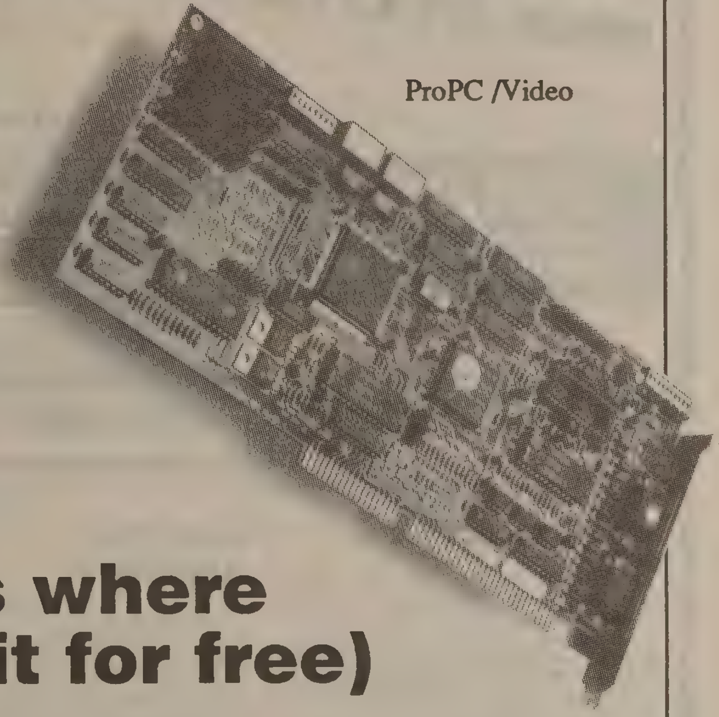
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COPROCESSOR	BUILT-IN	BUILT-IN
WEITEK SUPPORT	4167	4167
MEMORY TYPE	SIMM	SIMM
ON BOARD MEMORY	32MB	32MB
BASE CACHE MEMORY	64K	64K
CACHE EXPANDS TO	512K	512K
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PRODUCT SPOTLIGHT

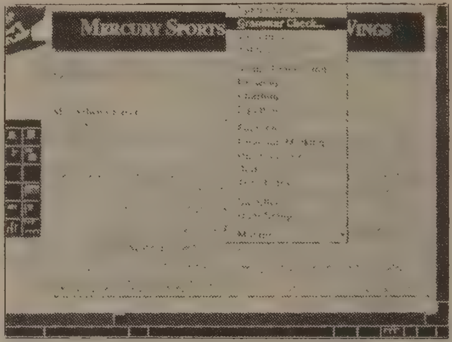
List Price: $149
Reviewed By: Woody Liswood

Earlier in the year, *MicroTimes* took a look at several leading Windows word processors (see "Word Processors for Windows," Issue #92). At that time I felt that Ami Pro was the best of the litter. Ami Pro 3.0 still meets my test as the "best" of the Windows word processors.

The first thing you'll notice is the speed. Ami Pro 3.0 seems quicker and more responsive than the older versions.

Drag and drop may be the most important new feature. Drag and drop means that you can highlight a block of text and move it to any new location by moving the mouse pointer, rather than by cutting and pasting. It saves time, keystrokes, and sanity.

Ami Pro's smart icon bar has been improved, even when I thought there was no room for improvement. You can have multiple icon bars—each one set up for different editing situations. The best new feature here is the ability to choose the size of your icons: EGA, VGA, or Small. In the past, when you switched to a higher resolution monitor, Ami Pro automatically changed from small to larger icons, pushing some of icons off the display to the right. Now, you can manually select "small," and keep all of your icons visible on a single icon bar.



Overall, almost every feature in Ami Pro 3.0 is improved, from style sheets and mail merge to fast format and clear screen features. The context sensitive help, for example, is available with a quick click in the upper right hand corner of all dialog boxes.

The only problem I had was in loading Ami Pro 3.0. When I first loaded it, it could not find the Thesaurus. I tried three different times, with no luck. A call to Help in Atlanta also produced no results. I tried again, only this time I loaded the automatic tutorial. Guess what: then the Thesaurus appeared as required. Other than that, no problems, no crashes, only quick word processing, the way it was meant to be. (Lotus Word Processing, 1000 Abernathy Rd., N.E., Bldg. 400, Suite 1700, Atlanta, GA 30328. 1-800-831-9679)

TOP PRODUCER

Published By: Top Producer Systems
List Price: $49; multiagent system, $695
Reviewed By: Woody Liswood

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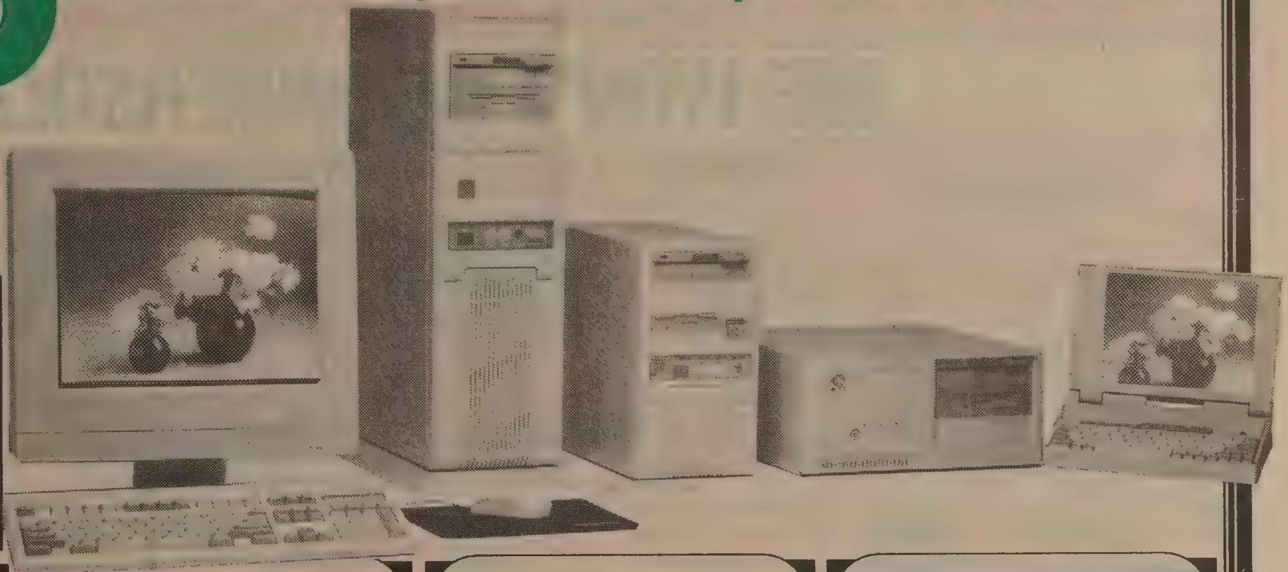

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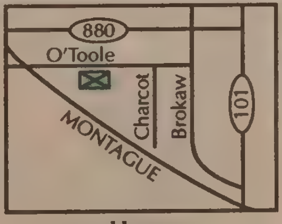

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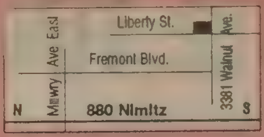

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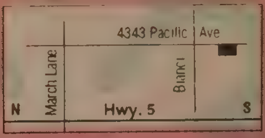

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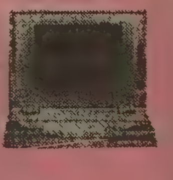

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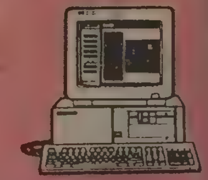

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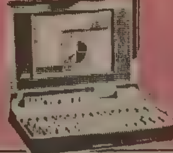

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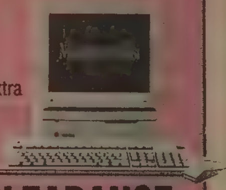

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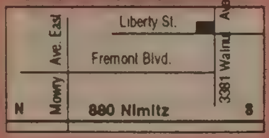

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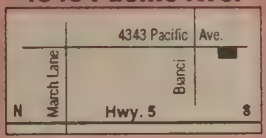

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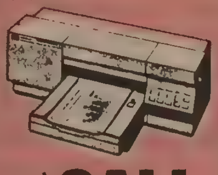

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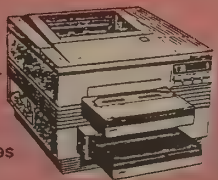

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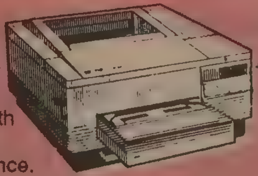

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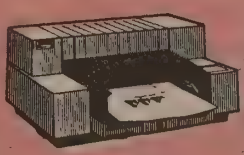

This color printer is ideal if you want primarily black output, but are eager to use up to 16.7 million colors and greyscale in your communications. Its 300 dpi color output rivals that of printers costing three times as much, plus it is networkable and prints on plain paper. Built-in spooling plus Hewlett-Packard's dependable 3 year warranty.

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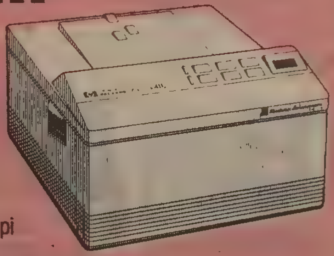

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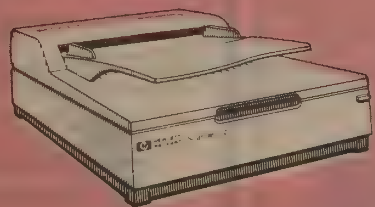

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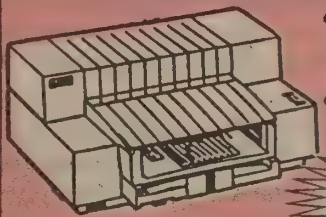

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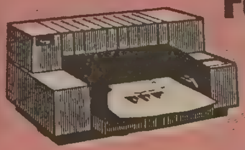

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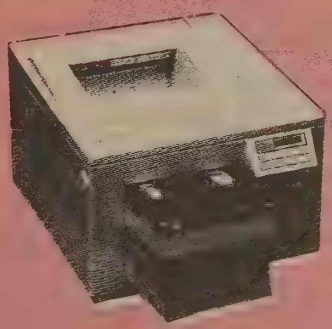

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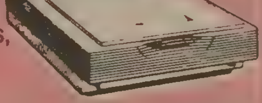

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through the databases is also easy. You can find almost anything by name, description, key word, phone number, or company name.

In addition to dialing the phone as part of your prospecting and farming activities, Top Producer includes telecommunications software. Although there is no scripting capability for automating searches or other regularly scheduled activities on your MLS BBS, it is nice to have all this in a single program.

Set up as a PIM, Top Producer lets you look at your scheduled calls, see current listings, what listing activities you plan to complete that day, the follow-up letters you want to write, as well as important dates to remember.

Top Producer presents a screen with the current and future home for each client. It is somewhat simple, covering price range, house type, square feet, number of bedrooms, number of bathrooms, as well as special features. However, this is certainly enough information to let you search through your MLS database to find new listings as they become available. Also, you can add detailed information about the homes, and information abut investment properties already owned by your clients.

Income and expenses are carried as a single item and summarized in month-to-date and year-to-date formats. This should help you track mileage and other tax-deductible expenses.

Top Producer will make everything work better if you are a real estate professional. If you are new to the real estate field, this program contains many of the ideas that are taught at the top real estate firms. (Top Producer Systems, Inc., 110 S.W. 27th St., Renton, WA 98055. 1-800-444-8570)

BECKER TOOLS 3

Published By: Abacus
List Price: $129.95; special introductory price through October, $59.95
Reviewed By: Woody Liswood

Becker Tools contains a variety of useful utility programs, all running under Windows, that will make your life easier, and perhaps become a lifesaver when a file is accidentally deleted.

This package contains an undelete utility, a file viewer for the popular file types, a text editor, a hex editor, a disk editor, a backup program, a file management shell, a floppy disk formatting and copying utility, a recovery/disk repair utility, and a screen saver with a few displays to keep you amused.

There are so many things that Becker Tools can accomplish; whenever I run Windows, Becker is there, ready to spring into action. The most important feature is undelete. At least once a month, I delete the wrong file, or a series of files. Becker is easy to use, and works as well as any of the DOS undelete programs you may be familiar with.

The recover part of Becker is similar to DOS chkdsk. It will search for unattached strings on your disk and convert them into a file for you to delete to recover space. It will also test your files for readability and physical errors, and attempt to repair any problems.

The Becker shell is more complete and easier to use than the Windows File Manager. Within the shell, you can search, select, and copy files with ease, as well as move and copy files and directories.

The Becker Backup program is competent. If you don't have a backup program, Becker works very well; it can format on the fly, has compression, password protection, and can back up or restore full or partial file lists.

Versions 1 and 2 of Becker tried to do everything on a single screen. With v3, you get a Becker program group and a series of icons to start up various parts of the programs. This is the way it should have always been. You can now find what you want, rather than try to understand a multiplicity of icons that you couldn't see in the older versions. (Abacus, Inc., 5370 52nd St. S.E., Grand Rapids, MI 49512. 1-800-451-4319)

Continued

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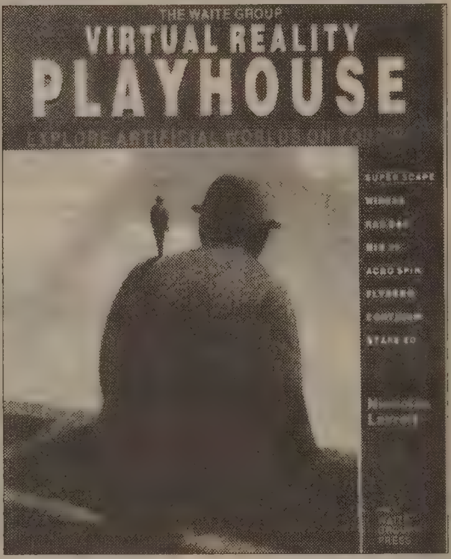
BOOK REVIEW

VIRTUAL REALITY PLAYHOUSE: EXPLORING ARTIFICIAL WORLDS ON YOUR PC

Author: Nicholas Lavroff
Published By: Waite Group Press
List Price: $22.95
Reviewed By: The Normals

If you still don't know what virtual reality is, or you know just enough to be curious, the *Virtual Reality Playhouse* may be the book for you. The book is divided into two sections. The first section, about thirty-five pages, is an introduction to virtual reality (VR). It has a brief history of VR, a description of input and output devices used in VR systems, and examples of real-world applications. None of these chapters go very far in-depth but they do cover the basics. The second section, about one hundred pages, consists of sample programs and documentation.



A disk with nine programs, each demonstrating different aspects of VR, is included. These are primarily demo programs from different software packages. You can fly in a MiG-29 flight simulator, play a 3-D game with bouncing geometric shapes and definable camera angles, and wander around in sample virtual environments created with the Superscape Visualizer and the Virtual Reality Studio. There are also several different wire frame rotating and creation programs, including one that uses red-blue glasses (also packaged with the book).

For people who like to tinker, there are even instructions on modifying the Nintendo power glove and the Sega 3D LCD shutter glasses for use on an IBM-compatible computer. All of the information and even the software is readily available from other sources, but the VR novice would have a hard time locating it. The book never claims to be the complete guide to Virtual Reality, though—it's a playhouse, and at $22.95 it's a bargain. (Waite Group Press, 200 Tamal Plaza, Corte Madera, CA 94926. 415/924-2575)

THE CUCKOO'S EGG: AUDIO TAPE CASSETTE

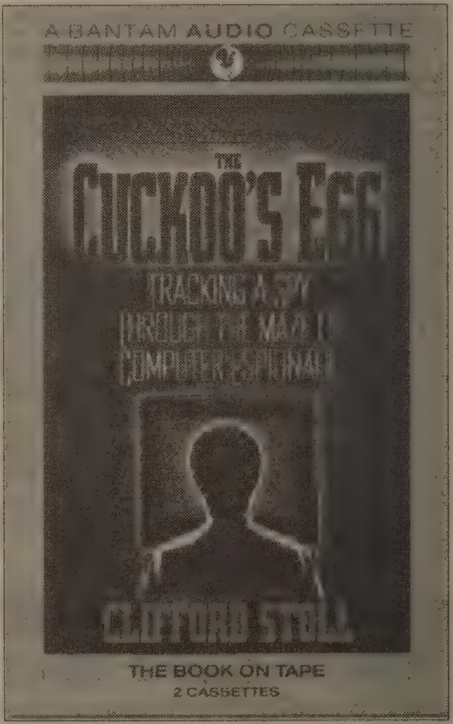
Written And Narrated By: Cliff Stoll
Published By: Bantam Audio
List Price: $15.95
Reviewed By: Woody Liswood

The Cuckoo's Egg, by Clifford Stoll, has been reviewed by many publications. It is the story of how an astronomer, assigned to a UNIX network, tracked down an extensive electronic spy network, mostly by himself, with some help from various individuals.

Recently, I had to drive a U-HAUL trailer from New Jersey to Colorado. A friend of mine, the new vice president of human resources at Bantam, gave me a handful of audio tapes to listen to as I drove across the country. I was doubtful that I would enjoy or even listen to these tapes. My earlier experiences with audio tapes ultimately resulted in boredom.

However, pulling three tons of furnishings and assorted belongings is a tiring venture, and the stories kept me from dozing at the wheel.

The Cuckoo's Egg was the most engrossing of the lot, especially since it was narrated by the author.



If you would like insight into UNIX systems, stubborn-minded perseverance, and the thought processes of a UNIX guru (or should I say nerd), get the book or listen to the tape.

If you are in any way involved in

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- 4MB RAM
- 2 Floppy (5 1/4" & 3 1/2")
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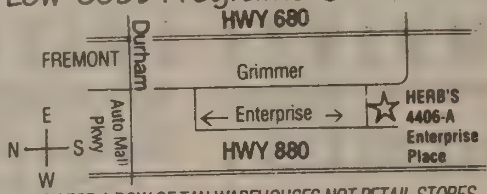

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PC HARDWARE

PANPACIFIC COMPUTERS: 486 SYSTEMS

Manufactured By: PanPacific Computer Corp.
Reviewed By: Lenny Bailes

PanPacific Computer has been quietly manufacturing and distributing high-quality motherboards and computer systems for the past three years. Its current crop of 486 systems delivers reliable performance at a low, competitive price. In addition to acting as a distributor for 386 systems, parts, and peripherals, PanPacific manufactures its own 486 machines. Currently, it offers both 33MHz and 50MHz 486 systems, as well as a 25/50MHz 486DX2 system. The systems include the basics offered by most clone vendors, plus VGA video card, mouse, SuperVGA monitor, and 120MB Connor IDE hard drive. All PanPacific systems utilize the leading edge MR BIOS (reviewed in issue #97N). MR BIOS provides virus protection, password protection, and support for 2.88MB floppy drives.

I've tested three generations of PanPacific motherboards, and never encountered a serious compatibility problem. 386 memory managers, Microsoft Windows, and OS/2 work without a hitch right out of the box. The PanPacific motherboards are made in California and include documentation for all hardware features. A separate booklet enumerates the various fine tuning parameters of MR BIOS. (If your video card permits, you can speed up the performance of graphic programs like Windows by choosing a higher bus speed and low wait-state DMA access.) The basic PanPacific 486 systems ship with a 64K static RAM cache, which can be expanded up to 512K. You can also substitute a name brand video card or monitor for the bundled generic ones. (The generic video peripherals should be quite adequate for everyday use: the monitor has a .28 dot pitch, and PanPacific offers three generic video adapters corresponding to the Trident, Paradise, and TSENG 4000 chipsets.)

The systems include unlimited lifetime technical support and a one-year parts and labor warranty. (PanPacific Computer Corp., 165 San Gabriel Dr., Sunnyvale, CA 94086. 408/720-1315)

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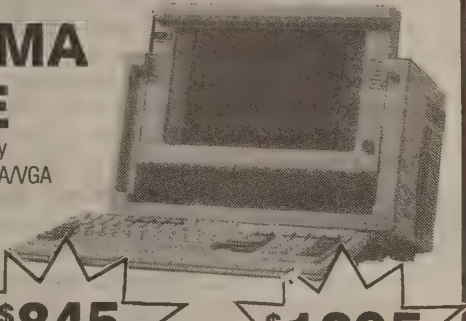

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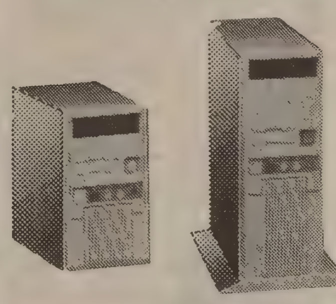

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- ENHANCED 101 KEYBOARD

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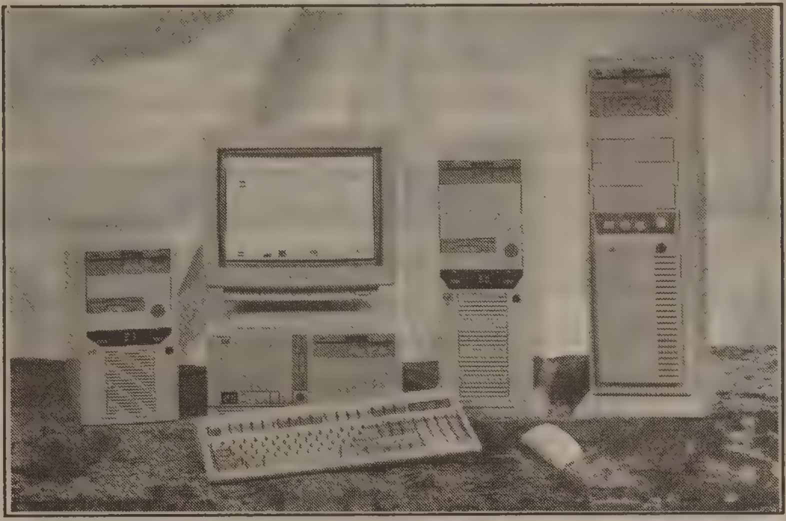

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AXIK'S COMPUTER SYSTEMS

THE BEST VALUE AND THE BEST REVIEWED MACHINE IN THE BUSINESS!!

INFO WORLD BUYERS ASSURANCE SEAL

Feb. 24, 1992

486DX-50

"In database server test, the **Axik** surpassed Dell, the previous leader, by 5 percent in transactions per minute (TPM). The **AXIK** was 4 percent faster than ALR. In the previous review, we attributed part of Dell's efficiency to its three-bay drive array. The **Axik** excels in this capacity with only one drive.

"The **Axik ACE** is a superior high-end file server with an extremely low price."

PCComputing

July 1992

486DX-50

"We liked the Axik more and more over time. Axik Computer's $2,899 Ace Cache 486DX2-50 System minitower was a favorite among our lab testers, who loved its chassis design and couldn't get over its outrageously fast hard drive performance."

PC Sources

July 1992

486DX-50

"A STATE-OF-THE-ART MOTHERBOARD ADDS SPEED"

"Solid components surround an advanced design that offers enhanced bus technology for future expansion. A low price is a bonus.

The 50 MHz 486DX system zips through applications with power and panache. And with the technologically enhanced and expandable motherboard, this system should satisfy your computing needs for years to come."

COMPUTER SHOPPER

July 1992

PC MAGAZINE

June 1992

486DX-50

"AXIK 486-50 BEAT ALL OTHERS ON PRICE, PERFORMANCE & FEATURES"

COMPUTER BUYER'S GUIDE AND HANDBOOK

CBG&H BEST BUY

July 1992

486DX-50

"A GREAT BARGAIN"

"Axik Computers has gone to the trouble to build its own boards—and its home-grown ACE-motherboard-loaded tower system blows the competition out the door"

"RECORD TIMES"

"That's why we run our RealWorld Benchmark Tests twice on the Axik: we didn't believe the results the first time out. For the most part, the Axik's scores were among the lowest (that is, fastest) we've ever seen."

"Flat-out performance doesn't mean much if you're not getting value in other areas. The Axik 486WB/50 uses high-quality components like TEAC and Quantum drives, an Orchid VGA card, and a well-built roomy tower case.

"All things considered the Axik at $2,849 isn't just a good deal: It's a fantastic buy!"

486DX-50

"You Can Have It All with the *Ace 486/50*"

MADE IN THE USA

"From the PC connoisseur's viewpoint the most interesting thing about the Axik is its motherboard. Axik makes its own boards, and the company's attention to detail shows"

"When you put it together, it's hard not to like the Ace Cache. While some buyers may be reluctant to go with a small startup company's computer, in this case, they should not be hesitant. This is a finely crafted machine made with quality parts. With the Ace Cache, you get great power, performance, and price. You really can have it all."

COMPUTER SHOPPER

August 1992

486DX2-50

Axik's positions the 486DX2/50 as suitable for all applications—from personal workstation to file server to desktop publishing or image processing—and it's right. This system is quite versatile and its moderate case size has ample drive-expansion space.

The benefits of the Axik's speed parts don't show up on the published benchmark scores, but you'll notice them when you're working with the system. For most people, even those with demanding applications, the Axik's 486DX2/50 makes a lot of sense. It combines easy and flexible CPU and I/O-bus speed upgrading, good expansion room for memory and drives, and a solid set of high-performance components.

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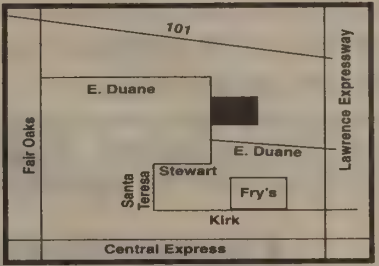

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- TEAC 1.2MB & 1.44MB FDD, 200 MB IDE HDD
- 2 S / 1 P port, 101 Keyboard.Calcomp 12X12 digitizer, Full size vertical case
- #9GXI graphics card. (L23)
  - TI 34020/32MHz 32-bit processor, 1280X1024 res. w/60 or 72Hz ref.
- DOS 5.0

$3,695

Desktop Publishing

- Intel 80486DX/50MHz CPU. 8MB memory, 256KB Cache memory.
- TEAC 1.2MB & 1.44MB FDD, 200 MB IDE HDD
- 2 S / 1 P port, 101 Keyboard.
- HP Laserjet III with LaserPix 4.0
  - 2400 dpi (graphic), 1200 dpi (text), 35 PostScript matched fonts
  - 256 gray level with 75, 106 or 150 lines
- Full size vertical case, DOS 5.0, Windows 3.1 & Mouse

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Desktop SignMaker

- 386/33MHz CPU, 4 MB memory, 64K Cache memory.
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- Diamond Stealth VRAM with Sampo AlphaScan 14" monitor
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  - 20-150mm/sec speed and 0.025mm/step res.
- Mini desktop case, 101 keyboard, DOS 5.0, Windows 3.1 & Mouse

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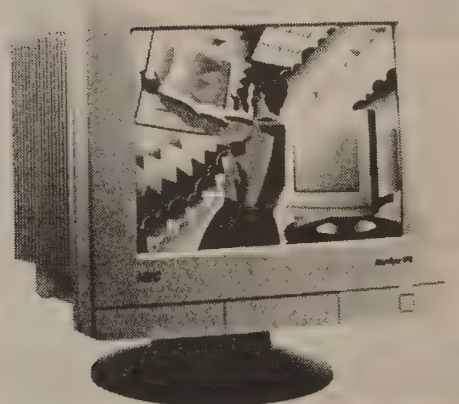

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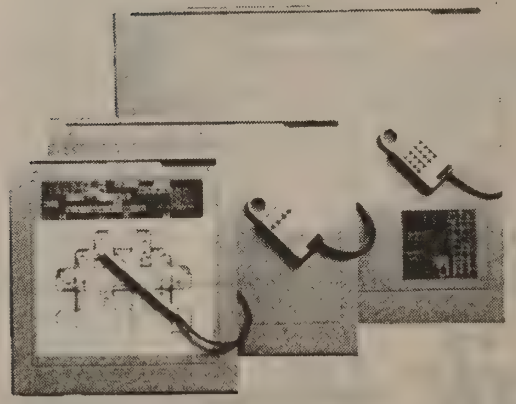

Local Bus System

- Intel 80486DX/50MHz CPU, Orchid CPU Board.
- 8MB memory, 256KB Cache memory.
- TEAC 1.2 & 1.44MB FDD, 200MB IDE HDD.
- 2 S / 1 P port, 101 Keyboard, Full size vertical case
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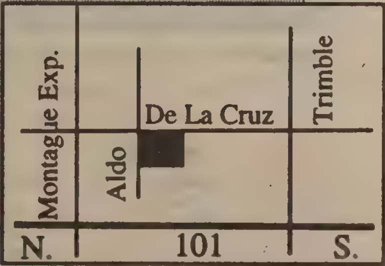

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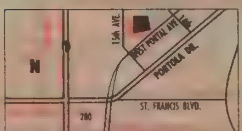

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CD-ROM Recording On The Desktop

Lots Of Choices For PC And Mac

BY TONY REVEAUX

Apple's new Performa 600 CD series, with internal CD-ROM player option, has made a strong step toward making optical playback media viable. The player that Apple chose is a winner. Not only is it a Sony, it's two-speed, XA-compatible and multisession PhotoCD compatible. Since the Macintosh is already ready in every other way, this configuration is now Mac-equivalent to a multimedia MPC. Now both DOS and Mac have come out with strong commitment—and co-dependency—to CD-ROM over CD-I or CD-TV.

A timely wave of support for the viability of CD-ROM comes in the form of affordable desktop CD-ROM recorders. CD-ROM prototyping, premastering, in-house disc replication, and secure publication of sensitive data can now be done by the average small business or office. Low-quantity, on-demand distribution of reference in medical, legal, financial, and educational applications is an increasingly realistic option. For transport and exchange of large files for graphics, multimedia and desktop publishing, the silvery wafers may take the place of most removable media, such as the 44 and 88MB Syquest and the Bernoulli cartridges.

With such desktop convenience, the storage and archival applications are many. Considering that CD-ROM players have dropped in price from nearly $2000 to present prices of from $400 to $700, it can be expected that recorder modules too will fall in time.

THE PHILIPS "ROLL YOUR OWN" CDD521 RECORDER

For $7995 list, you can hitch your PC to an optical recorder that can make CDs. Industrial recorder systems have been available for between $30,000 and $50,000, but now can be scaled down to the desktop.

The CDD 521CW can record CD-ROM, CD-ROM (XA) and CD-I, and audio compact discs. It is also capable of multisession recording where discs, once recorded, can be updated with new information. As with the multisession Kodak PhotoCDs, you can't write over recorded tracks, only those areas not yet written on. The recorder is connected to a PC through a SCSI interface, with a transfer rate of 352K per second and a capacity of 680MB on a disc. It has built-in error-detection/correction software and individual calibration of each disc for optimal recording. The CDD 521CW is bundled with Philips' CDWRITE MS-DOS-based software which is a recording management and publishing program. It records any files (data, images, applications) in DOS on ISO9660 format from a PC hard disk to a CD-Recordable (CD-R) disc inserted in the CDD 521CW. A Macintosh version of the Philips subsystem is "due soon."

SONY'S CDW-900E RECORDER

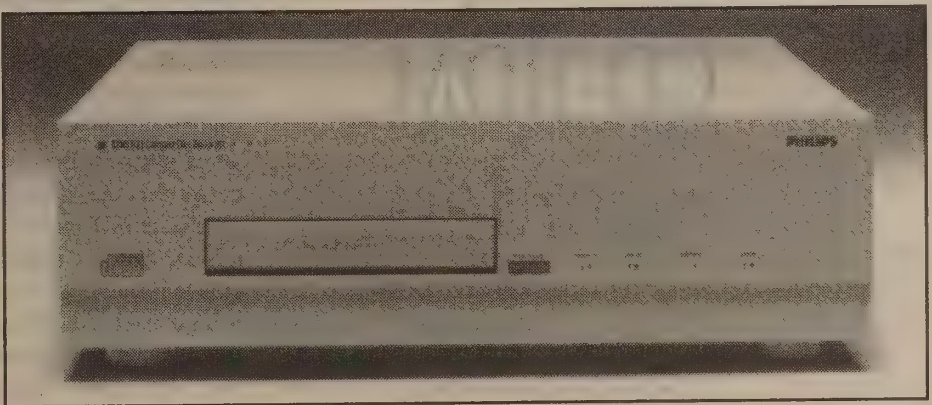
Philips and Sony are the world's leaders in electro-optical recording technology development. Sony was already showing prototypes of a tabletop CD recorder two years ago, and now it is ready to compete in the desktop marketplace with this offering. The price has yet to be announced, but is expected to range under $20,000. The CDW-900E subsystem works with IBM/compatible, Apple Macintosh, and UNIX-based PCs and workstations. It can record CD-ROM, CD-ROM (XA) and CD-I, and audio compact discs.

Like the Philips machine, the CDW-900E direct-records at double speed, at half the running time of the playback mode. Unlike the Philips, it can also record in real time. Up to sixteen CDW-900E subsystems can be daisychained for simultaneous recording via SCSI Bus controller. The device converts logical data from the host computer into the appropriate digital format, and adds sync and header signals.

JVC'S PERSONAL ROMMAKER

JVC introduced its $12,799 MS-DOS RomMaker in March, and now is ready to deliver a Macintosh version at the same price, and with a very interesting software premastering package.

A special bundling deal will offer both DOS and Mac RomMaker software. JVC also will combine the RomMaker with its $8,500 4mm DATA/DAT Drive. The Model BC-TW1020B for the Macintosh requires a Mac IIsi or higher with System 7, HyperCard and 4MB or more of memory. The subsystem includes JVC's 5.25" write-once CD-ROM drive and a dedicated 680MB hard disk drive. According to Willard D. Harlow, product manager/Professional Interactive Media Systems of Philips, that company too will probably offer a ver-



The Philips CDD 521 Double-Speed Desktop CD Recorder will read and write to CD-ROM, CD-ROM (XA), CD Multisession, CD-I and CD-Audio, and will read Kodak PhotoCD.

RESOURCES:

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Tony Reveaux, a San Francisco-based consultant, is the editor of Computer Publicity News *and a contributing editor for* Artweek, *and writes the "MediaScan" column in* Film/TapeWorld. *He can be reached via Usenet (luna@well.sf.ca.us) or MCIMail 290-3008.*

A timely wave of support for the viability of CD-ROM comes in the form of affordable desktop CD-ROM recorders.

sion of its CDD with a dedicated hard disk.

The Mac RomMaker software is accessed through a HyperCard interface. It has multiple output formats for physical images and provides user control on file and folder attributes; it is network compliant and allows complete user control of the CD-ROM layout. It also allows users to premaster a CD-ROM that mounts as a HFS volume on Apple CD-ROM drives and ISO 9660 volumes on DOS and UNIX machines. It has comprehensive virtual testing and simulation capabilities for validating CD-ROMs before replication, statistics reporting for analysis and performance optimization of CD-ROM layout. It also has a verify utility to compare premastered images stored on different media, such as CD-ROM produced with DATA/DAT tape sent to a mastering plant, and a copy utility to transfer output from one media to another like 4mm tape to a WO CD-ROM image.

KODAK PLAYS IN

Kodak has been making alliances and handshakes throughout the computer industry. The new QuickTime, v1.5, will incorporate PhotoCD compatibility. With the capability to play back Kodak PhotoCDs, the Philips machine is at an equal with Apple's Performa 600 CDs and most of the new CD-ROM players.

As versatile as these desktop optical media recorders are, they cannot write to Photo CDs. That action requires a proprietary turnkey system driven by a Sun Sparcstation, available through Kodak or an approved service bureau. But there is a very strong connection between Kodak and the optical recorder manufacturers. "Kodak," says Willard D. Harlow of Philips, "will be the major force that will drive down the pricing on blank media for these recorders. If the list price per disc is say $35 or $40 now, once the demand for PhotoCD gets rolling, we'll see the same kinds of costs decreased in optical, just as we saw it happen for floppy disc magnetic media—where the cost now is one-third, or even less, of what it used to be." In volume publishing, CD-ROMs, like audio CDs, cost about $2 a pressed disc.

PIT STOPS ALONG THE OPTICAL RACEWAY

CD audio, CD-ROM, CD-I, and PhotoCD all use the same CD-WO (Compact Disc-Write Only) technology. The recordable, or CD-R, disc is similar to the conventional audio CD, except that the audio CD has a spiral track consisting of a series of depressions called pits. In CD-R, the substrate contains a spiral groove without pits. Pits will be recorded in this groove by the recorder head's 6–8mW laser heating up the sensitive organic absorption layer locally. The rest of the requirements and parameters are the same as the Red Book, or audio CD standards. The maximum recording/playing time is about 74 minutes, equal to normal CDs, with two-channel stereo, 16-bit equalization, and 44.1kHz sampling frequency.

Harlow points out another CD-R format, the smaller disc—analogous to a 45 rpm record compared to an LP—that can hold 200MB of data and has about a 20-minute recording/playing time. "They cost about the same now as the 4.5" discs, and they aren't used very much yet, but I think that they will come out as an important option as the desktop recorders become established," he predicts. They would become even cheaper than the standards, and would fill a niche where portability and further compactness are valued.

This is the size of optical media that future hand-held multimedia players such as Apple's SweetPea would use. The military is studying them along with other optical options. For business use they can be carried in a shirt pocket and mailed in a letter envelope. They are ultra-compact for storage and can provide media for compact data access in the field.

PIRATE STATION

With each technological advance that empowers us, potential abuses often follow. When I asked Ken Wasch, Executive Director of the Software Publishers Association, what this expanded recording arena would mean for the threat of software piracy, he said, "It's going to be a problem. Previously, CD-ROM-based applications were beyond the means of most users to copy intact. That barrier may, in the future, be crumbling.

"The ability to read and write CDs puts in the hands of consumers the means to copy vast amounts of intellectual property. However, it may give you the ability to do that, but it doesn't give you the authority. In our industry, we still have only two weapons against software piracy: moral suasion and—when that doesn't work—litigation."

OPTICAL DREAMS

Rick Smolan, author of the *Day in the Life of...* series of photo-essay books, and part of the Ofoto scanning software team at Light Source, created a new narrative-driven book called *Alice and the Ocean* based on his photo book *Tracks*. The material was so compelling that he produced an interactive CD-ROM to tell the story.

"At first," says Smolan, "I didn't think of really publishing it, because at the present time the installed base of Mac CD-ROM players would only create a demand for about ten thousand copies. John Sculley saw *Alice* and came up with an arrangement to do it." A copy of *Alice and the Ocean*, published by Voyager, will be part of the ten-title bundle of CD-ROMs that will be included with every Performa 600 CD. Apple will provide an equal number of copies to Smolan that will be sleeved with every copy of the print version of *Alice and the Ocean* book. The first *Alice* book/disc package has already been released in Japan. Within just this year, the potential market for CD-ROM publishers should provide many more oceans for many more Alices. ■

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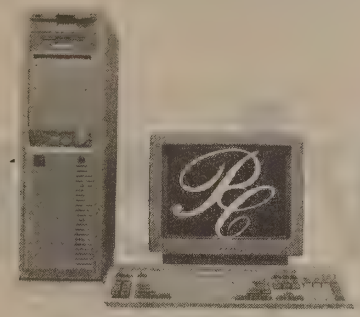

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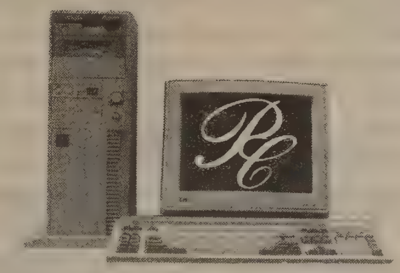

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Very soon, Interactive Video Systems (IVS) will be releasing its much anticipated animation program Moviemaker, which delivers full-screen (overscanned), full-motion computer animations, played directly from an Amiga's hard disk. Although it supports all of the native Amiga display modes, Digital Creations' DCTV provides full-color composite video output. Frame rates of thirty frames-per-second (fps) or greater are possible without using an expensive single-frame recorder. Sixteen-bit CD-quality stereo sound and SMPTE timecode are also supported!

This is truly what-you-see-is-what-you-get (WYSIWYG) animation. You can quickly arrange and rearrange the playing order of images in an animation and instantly see the results. IVS has demonstrated Moviemaker at various computer shows using Amiga 3-D animations and a scene "grabbed" from the movie *Back to the Future*. If you didn't know better, you would swear you were watching a video tape with hi-fi sound.

IVS is best known for its Trumpcard-series SCSI disk controllers. In fact, Moviemaker started out as a means for IVS to show the capabilities of the controller cards. The main obstacle of achieving the miracle of Moviemaker is overcoming the data bottleneck. Thirty fps with 16-bit stereo audio requires a tremendous amount of continuous data transfer from a hard disk. Moviemaker accomplishes this without a hardware compression scheme.

USING MOVIEMAKER

Sam Noonan, the programmer behind Moviemaker, gave me a hands-on demonstration of Moviemaker at the IVS offices in Garden Grove. He explained that the high data transfer rate is partially achieved by setting up a special hard disk partition called MM. Using IVS utilities, this partition is specially formatted—you will not be able to access the data in this partition conventionally.

Before images can be used by Moviemaker, they must be loaded from normal AmigaDOS sources (hard disk, floppy disk, etc.) and saved using a proprietary file format in the MM partition. Of course, you can preview the images on your monitor before you do the conversion. The optimized disk and file formats help Moviemaker retrieve the data much more quickly than if the standard AmigaDOS file system were used.

Separate images can be loaded one at a time, or you can load standard Amiga animation files. You can also automatically load an entire directory of files. This is nice for animation rendering programs that generate numerically sequenced pictures (e.g., Pic001, Pic002, etc.).

There is also no restriction on image formats. In other words, all of the images do not have to be HAM, Low resolution, DCTV, etc. The animation can contain a mixed bag. Even the frame rate can change within the same animation.

As the video data is loaded, Moviemaker automatically calculates the maximum frame rate possible, taking into account hardware capability, display mode, resolution, etc. You must also reserve space for the audio data. If the frame rate is too low, reducing the size of the image, decreasing the audio sample rate, or making the audio monophonic, will help increase it. At this point, only the space is reserved; the actual audio data is not loaded. Ultimately, each video image will have a "slice" of audio saved with it.

Once the video images are saved, you load the audio. This part of the program was still in development, but Noonan indicated that this feature will be implemented in a "time-line" sort of fashion, similar to the way movie images are sequenced.

> ***This is truly what-you-see-is-what-you-get (WYSIWYG) animation. You can quickly arrange and rearrange the playing order of images in an animation and instantly see the results.***

After the audio has been "attached" to the video images, you are left with a database of frames (images), called the default movie, from which you can pick and choose to make your presentation. Moviemaker creates this by scanning the MM partition—the default movie is all of the data in the MM partition, sequenced in the order the images were loaded.

This is where the fun begins. Moviemaker's non-linear digital editing works much like cut-and-paste editing in your word processor. If you want a range of frames to appear in your movie, you merely mark the first and last frames and copy them. Next, find the spot on your movie time-line where you want those frames to appear and paste them in. You can use the mouse to pick up and drop the range, or use keyboard equivalents. The same frames can also appear more than once in the same movie; however, the images themselves still only appear once on the hard drive.

To provide logical and visual guides, a movie is normally composed of several scenes. The beginning and ending of each scene can be set any way you desire. This allows you to quickly locate specific frames. Scenes are artificial divisions of the movie. Having scenes is not a requirement, since the same movie can be a single scene or divided

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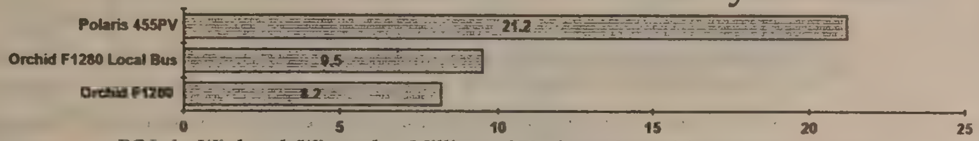

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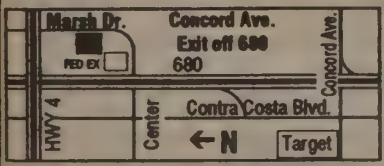

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up into several scenes—the movie would play the same in either case.

You can create several movies from the same default movie. Thus, if you didn't like the way a movie came out, you could easily duplicate it and re-edit it, or completely start over without destroying the original movie. Several movies can be in memory at the same time. Also, each movie takes up very little disk space since they are basically just lists of the frames that are to be shown.

Moviemaker really shines when used with DCTV, though HAM images were also impressive. Because a DCTV file is equivalent in size to a high resolution Amiga graphic file, but provides millions of colors instead of sixteen, DCTV is the perfect display device for Moviemaker. In fact, when 24-bit images are loaded, they can be automatically converted into DCTV images. Also, when you're using a composite monitor, which DCTV requires, the Moviemaker panel will appear normal on both the composite and Amiga RGB screens. Anyone who's used DCTV will welcome this feature, since it doesn't require you to constantly switch from one monitor to the other.

Normally, one of the problems with using DCTV as the sole display device is that all of the images must use the DCTV file format, so if you wanted to show a graphic that used one of the normal Amiga modes, you would have to translate it first. Moviemaker gets around this with the inexpensive Commodore A520 Modulator. By using the A520 to convert the normal Amiga display into composite, then re-feeding the composite signal into the DCTV unit, Moviemaker can decide on the fly whether to show the DCTV output or passthru the composite-in signal to the monitor.

> *Moviemaker really shines when used with DCTV. Because a DCTV file is equivalent in size to a high resolution Amiga graphic file, but provides millions of colors instead of sixteen, DCTV is the perfect display device for Moviemaker.*

Though you can use the keyboard or mouse, a trackball provides an efficient (and fun) means of locating desired frames. Moviemaker also has a full complement of controls for play direction, speed, jumping to various parts of a movie, etc. Flipping through the demonstration movie using the trackball was an incredible experience. There is a real feeling of power over the animation as you scan backward or forward through the frames. Optionally, you can even hear the audio associated with each frame. Sure, you can have frame-accurate control using a laser disk player too, but it is nothing like this.

Currently, CD quality sound is only achievable using an unreleased proprietary 16-bit sound card. However, the standard 8-bit Amiga sound channels are supported. Third-party 16-bit sound boards are incompatible, according to Noonan, because they are too slow.

As you might expect, to achieve optimum performance you need a certain hardware configuration. Currently, the fastest setup is an Amiga 3000, because of its 32-bit chip RAM access, and a—surprise—IVS Trumpcard Professional. However, this may change in the future with the release of IVS's 030-based Vector accelerator board for the Amiga 2000. A large and fast hard disk is also desirable. Sam noted that with respect to hard disk speed, it is the sustained data transfer rate that is important, not the disk access speed, which is the normal yardstick for rating hard drives.

In any event, a hard disk must support Rigid Disk Blocks to operate properly with Moviemaker. This is the only way Moviemaker can find and recognize the special MM partition. There is no need to mount the MM partition, however; Moviemaker can access it automatically.

Depending on your Amiga setup, you may only need to purchase the Moviemaker software. However, some hard disk controllers do cause problems. Also, with storage requirements of up to 100MB per minute of animation, you'll probably need a large hard drive too. Performance will vary depending on your system. At first I thought the Syquest drive connected to my 3000 would give me acceptable results; however, my calculations indicate that I'd only be able to get about 10 fps, due to the low transfer rate of the Syquest. IVS will probably provide a list of compatible controllers and recommended hard drives once the product is shipping.

Note that for the most part, images will have to be computer generated. Don't expect Moviemaker to grab a scene from video tape on the fly. The *Back to the Future* demo was digitized frame by frame from a video disk player using DCTV. At 24 to 30 fps, this can obviously take quite a long time.

The price for Moviemaker has not yet been set, but IVS indicated that it will be affordable and not targeted strictly for the high-end user. With hard drive prices falling like lead balloons, a usable system should not be unaffordable. Even if you could find similar capabilities on another PC platform, it won't be close to the price of a Moviemaker setup.

OTHER PRODUCTS FROM IVS

Louise Finno, Director of Sales at IVS, provided me with an overview of IVS's product line, including the upcoming Vector board, an accelerator for the Amiga 2000 based on the 68030 or 68EC030 processor. The 68EC030 is basically a 68030 without the MMU. However, since Vector can re-map the Amiga Kickstart ROM to 32-bit RAM, the absent MMU will normally not be missed.

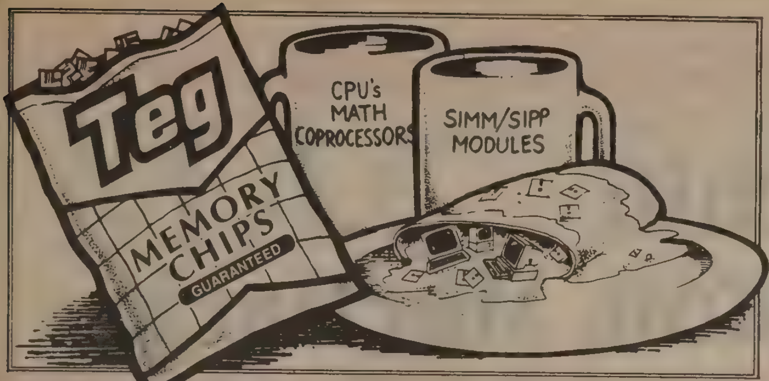
There will be 25, 33, and 40MHz versions available. Memory will be expandable to 32MB of 32-bit RAM using industry standard SIMMs. Since Vector has a 2630-compatible expansion bus, it can take advantage of certain third-party expansion products. This brings the possibility of increasing memory to 144MB! It also has a built-in high speed SCSI controller, based on the Trumpcard Professional. A hard disk can be mounted directly on the board.

IVS has called the Vector a "third" generation accelerator. For compatibility reasons, it is sometimes necessary to boot an Amiga in its native 68000 mode. Unlike other accelerator cards, Vector allows RAM and SCSI resources on the accelerator to be accessed by the 68000, when the '030 chip is disabled. IVS calls this "proplexing." Depending on the amount and type of RAM installed, up to 8MB of RAM will be available to the 68000. Disabling the '030 chip is easy using the options screen, accessed by holding down a mouse button during bootup.

Most of IVS's SCSI controller cards, including the Vector, have SCSI networking capability included at no extra charge. SCSI-SHARE allows up to seven Amigas to share one or more hard drives on the SCSI bus. This is not a full fledged network since shared write access to the same partition is not permitted due to a limitation of AmigaDOS. There are also limits on cable length, though it has been tested up to 80 feet.

IVS has numerous other exciting products, including a RAM card, IDE controller and an add-on printer port. The printer port device frees up the parallel port by adding a output-only port designed to connect to printers. This is included on their Grand Slam multifunction card or can be purchased separately.

Moviemaker and Vector will be great additions to IVS's already solid product line—even before their release, they are attracting a lot of interest. Moviemaker was certainly a show-stopper at the recently held Showbiz Expo in Los Angeles. ■



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The Show Circuit: Macworld Boston, MacHack

But No Computers At Cal Expo

BY DAVID MORGENSTERN

In August, the entire family took an excursion to the State Fair at Cal Expo. We enjoyed seeing the animals, betting on the horse races, walking through the endless halls filled with junior crafts exhibits, getting stiff necks on flashy carnival rides, and checking out the many tattoos. The weather was hot! As the day wore on, and we covered every square foot of the fair, it became obvious that something was seriously absent from the exposition—computers.

In the Silicon State, with computer manufacturers, developers, and thinktanks in every community, it's shameful that there was no technology demonstration other than the latest in hot tubs. Even mediocre demonstrations of QuickTime, personal information managers, or multimedia would have blown the baseball caps off this crowd. Is the computer industry so inbred, so complacent, that it can only deal with individuals already addicted to technology?

Most of the people visiting Cal Expo, the same people that you pass on the street or in your car, have never witnessed these cool programs in action. They may have played with their kid's Nintendo, or seen a movie with a computer, but have never witnessed the current crop of personal computers, operating systems, and software. They don't need a glimpse into the future—the software available in stores today will be more than sufficient.

BMUG knows that the only way to appreciate and evaluate computers is to see them yourself and to grill the developers. That's why we have more meetings than any other user group in the world. Please come and join the fun!

BMUG

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LOST IN BOSTON: THE POWER TO BE YOUR BEAST

As a parent of a teenager, I'm used to the the nothing's-interesting state of mind. I ask my daughter what happened at school, and get the typical "nothing" response. This is also true of BMUG regulars at Macworld Expositions. They can never seem to find anything interesting at the show. They claim to have seen it all before—usually at BMUG meetings!

But you know there's a serious problem when everyone attending the show, ordinary Macintosh users, sleepwalk up to the BMUG booth with heavy eyelids and complain of catatonia! What was going on?

This was the PowerBook Expo, with loads of products developed specifically for the notebook computers. Although the PBs have been a monster success, not everyone has junked their desktop machines. If you didn't have a PowerBook, the various permutations of tiny video-cards, batteries, and modems held little allure. You could tell the PowerBook owners from a distance—they were listing heavily to the side like a sinking boat, weighed down with the ever-present PowerBook, shrink-wrapped boxes of new add-ons, and the routine ton of Expo handout papergoods.

The BMUG booth was filled with the usual Great Stuff. The latest BMUG Newsletter is packed with dozens of fascinating articles, including a visual aid to what each of the PhotoShop filters does to an image (a real time saver), and even an article on Chinese Feng Shui magic, with an analysis of future Macintosh products. There's even a byte of NeXTrasensory perception.

The Expo saw the introduction of the latest edition of our software encyclopedia, the *1993 BMUG Shareware Disk Catalog.* It's being published by Addison-Wesley and is 686-pages full of the latest entries in the BMUG Library. There are lots of new fonts, HyperCard stacks, and utilities. It's available from BMUG or in your corner bookstore.

Here are some further sights from the Boston Macworld Expo floor:

- Everyone's pick for coolest product at the show was Morph from Gryphon Software. If you haven't been to a science fiction movie in the past couple of years, or watched MTV music videos, then you probably don't know beans about morphing. But when the new model of the Terminator changes shapes, or faces merge into one another in a Michael Jackson video, you're seeing "morphing" in action. In the Gryphon booth, political candidates Bush, Bill Clinton and Ross Perot kept following each other like a nightmare karmic cycle.

> In the Silicon State, with computer manufacturers, developers, and thinktanks in every community, it's shameful that there was no technology demonstration other than the latest in hot tubs.

The transition pictures can be kept as a PICT, or as a QuickTime movie, so they can be edited further in a graphics program. This kind of special effects was previously done on highpowered graphics computers, with expensive multi-thousand-dollar software. Morph lists for only $149, so we will be seeing a lot of male merging on desktops this year.

- ShareVision Technology showed a future color video conferencing

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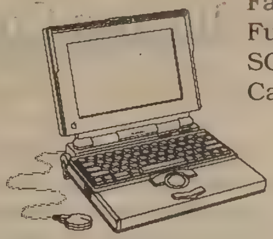

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system in the Apple System Software Showcase. ShareVision is a pair of NuBus cards, one with a v.32bis modem, and the other a compression engine, a critical addition when you start tossing around the colossal amounts of data required for video conferencing. The setup also includes a little video camera and a microphone. The ShareVision system doesn't need ISDN or anything fancy (other than itself) and runs over normal phone lines!

On your Macintosh screen you see small windows with the video images, one of you and the other of the person you're talking with. You both can have a document open and edit it together, if the program supports the required AppleEvents. The little video pictures had little shakes and dropouts reminiscent of QuickTime, but you're going to lose something squeezing video, audio, and computer data over standard phone lines.

The company claims that the whole system will only cost $1,500. Does their accountant share that vision?

> The really innovative stuff was not being shown on the Expo floor—it was a couple of blocks down the street at Apple's System Software Showcase, held in the Boston Computer Museum.

•If you wanted to pour money into your PowerBook, there were opportunities galore to do so. Color replacement screens and boards to drive external color monitors were very hot—and running a little hot considering the puny power supply in the notebooks.

Microtech International showed the most creative hardware addition to a PowerBook, a solar panel. The device will reportedly list for $189 and attaches on top of the screen, facing up toward the sun. It plugs into the power port and will "extend battery life," but not recharge the battery. Interestingly, it also plugs into the microphone port, which will tell you if the panel is in the best position for getting a tan. The best thing about the panel is that it will double as a shade for the screen, so that it won't wash out in the bright sunlight. Since bright light was scarce on the floor of the show, the performance was difficult to judge.

The BMUG PowerBook Utilities disk was a big favorite of the Eastern power elite. It's available for only $4 from the BMUG office.

Although there were new programs introduced at the show, most of the booths were showing updated versions of software, some that now support QuickTime, AppleEvents, and other System 7 technology. It has taken longer than expected to integrate some of these features into everyday applications. The really innovative stuff was not being shown on the Expo floor—it was a couple of blocks down the street at Apple's System Software Showcase, held in the Boston Computer Museum.

The Showcase was filled with demonstrations of future systemware and products in development that will use these features. Unlike the futuristic technology that we've seen paraded around recently, voice and handwriting recognition, or speech synthesis, these are additions to Macintosh operating systems that will appear on our desktops in the near term. Get used to a whole new vocabulary and alphabet soup with AppleScript (the way users will be able to automate their work), QuickDraw GX (the rewrite of the Macintosh imaging model "the graphics stuff"), WorldScript, and Open Collaboration Environment (a standard way for developers to support electronic mail in their applications). Hopefully we will be able to see some of this technology out on the show floor in the next San Francisco Expo, since some of these technologies will actually ship in 1993. See you there!

TWIST AND HACK

I finally got to grill the members of the BMUG programmers Special Interest Group about the MacHack Conference held last June. This is the premiere programming event of the Macintosh world. Many of the best and brightest Mac talents are in attendance, and it's a working vacation for some of the Blue Meanies, the System 7 technical gurus and arbiters of good taste in coding.

Everything at MacHack is a hack. When a tornado decided to touch down a couple of miles from where the conference was held, it was the "Weather Hack." The determined software-heads kept programming relentlessly on their PowerBooks in the shelter. After lightning struck a tree outside the infamous Machine Room, where all-night programming sessions are the rule, the code meisters did not miss a beat. Neither rain, nor sleet, nor tornadoes, shall keep a hacker from the hack.

There was a bit of evidence that not everyone is thrilled with the way that Apple upper management is heaping the dough into high-profile futuristic system software, instead of half-finished projects of the here and now. System software engineers were heard complaining that advanced technology is getting all the glory and support. A project manager said of speech synthesis and recognition, "There's a project going on inside of Apple that has spent so much money that we could hire someone to stand by each Macintosh and read out loud."

The MacHack contest and award banquet conclude the week's celebration of Mac-ness. Throughout the week, everyone works on little

UPCOMING EVENTS:

September 24	Abacus Concepts, Statview 4.0; NEC Display cards and Accucolor Control System.
September 28	BMUG West at Exploratorium museum in SanFrancisco. Ikegami Color Monitors; Eclectic Software, NetVantage II (Macintosh NetworkSimulator).
October 1	No Hands Software, Magnet 1.0 (filemanagement); WordPerfect Corporation, LetterPerfect and WordPerfect.
October 8	AEC Software, FastTrack; Gryphon Software, Morph.
October 15	Steven Levy, *Artificial Life* (book); Now Software,Now Utilities 4.0.
October 19	BMUG South at United Way Office in San JoseKensington, TurboMouse 4.0 and Numeric Keypad for the Powerbook.
October 26	BMUG West at Exploratorium museum in San Francisco. To Be Announced.

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programs that are either brought half-baked to the conference, or written entirely there. The best hacks are saluted and awarded goofball prizes. Here are a few of the choice bytes:

•The winner of the contest was IR-Man by David Falkenberg and Mike Neil. IR-Man is a hardware/software combination that controls a Mac using ordinary handheld VCR or stereo infrared remotes. They showed a VCR controller "winding" and "rewinding" QuickTime movies on a Macintosh. There's a hardware serial device (around $30 in parts) that picks up the infrared signals; then the software analyzes the signal and matches it to the desktop command assigned to that remote control button.

•NetMouseControl is a long name for a very interesting hack. Some lucky Mac users have two monitors on their desktop, side by side. The Macintosh easily understands this kind of setup, and allows you to have one giant virtual desktop across the displays. But what could you do with two Macintoshes side by side—the exact situation of many PowerBook owners?

Everything at MacHack is a hack.

NetMouse is a pair of extensions that allows you to use one mouse and keyboard for two different Macintosh machines. When you move the mouse to the extreme sides of the menu bar, the cursor moves across the network to the other Mac that you can control. It works as if the two machines shared a single keyboard. It's program-to-program communication in action, in this case the "program" is the Finder!

•The first winning hack by a female programmer was Kathy Brade's Bell Choir. This program simulates a bell choir, using a series of network Macs. A real bell choir is a group of people, each playing several tuned bells. Each player is responsible for particular notes of the scale. As the piece of music is played, each bell ringer hits the assigned notes at the correct musical moment. It's very difficult ensemble playing for humans—not too hard for a Macintosh network.

•BMUGer Leonard Rosenthol and Alex Rosenberg from Apple won fifth place with MovieFinder. It replaces the old "boring" run-of-the-mill static color icons with little QuickTime movies in the Finder. This hack was picked up by a publisher after the conference and will be bundled into some commercial "utilities" package.

•There were many PowerBook hacks, including Strobe, which turns your PowerBook into a very expensive strobe light by flashing the display backlight. Flashback does a similar thing except with a network of PowerBooks. Some of the PowerBook hacks were useful—or a little more useful. Insomnia by Stephan Somogyi waits for you to plug the charger into your PowerBook, and then disables the power-saving Idle mode automatically.

Special thanks to Tom Lippincott, Leonard Rosenthol, and Eric Slosser for allowing themselves to be grilled. ■

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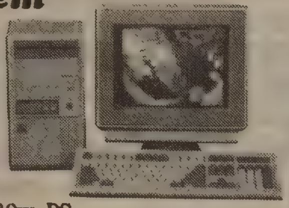

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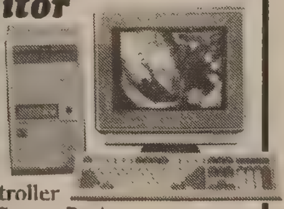

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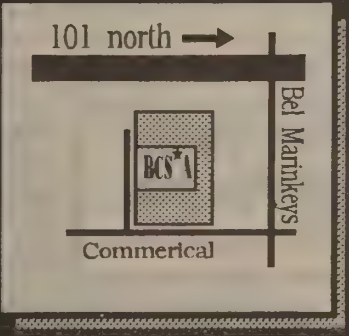

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BMUG is an educational non-profit consumer advocacy group organized to share information, and provide critical direction to users and developers in the computer community worldwide. It is an independent advocate, not affiliated with any manufacturer, delivering trustworthy information and useful products.

Everyone's pick for coolest product at the show was Morph from Gryphon Software.

Like any growing organization, it is many different things to its 13,000 international members. BMUG supports many Special Interest Groups (SIGs), an eight-line Bulletin Board System (BBS), free HelpLine, software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 400+ page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6-9 pm (or whenever we finish), in the Physical Sciences Lecture Hall on the UC campus. BMUG West is a meeting held monthly in the Exploratorium, San Francisco's science museum.

The BMUG Office, 2055 Center St. (a half block from the BART Station) is open to the public 9 am–5 pm. Please come by and say hello, meet other members, and hang out.

The BMUG HelpLine, (510)540-1742, and our fax number, (510)849-9026, provide technical assistance and telephonic hand-holding during business hours (11 am–5 pm). If your question can't be answered on the spot, we try get you in touch with someone that can help. Of course, not every problem can have a happy ending—but we try.

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BMUG can be found on most electronic services. BMUG can also be reached through the international USENET network through bmug@garnet.berkeley.edu.

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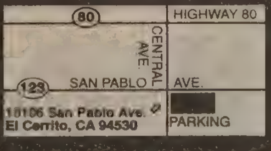

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continued from page 26

CPUS FOR THE REST OF US: MOTOROLA ADDS CLOSED-CAPTIONING TO TV CHIPS

When most people think of CPUs, they think of their desktop or laptop computers. Motorola, the maker of the CPU used in Macintoshes, also manufactures embedded processors, the CPUs that come in many appliances like televisions, cars, and microwave ovens.

If you didn't think your TV had a CPU, think again: a CPU controls everything from making sure you are locked on a channel to displaying the volume level on the screen (if you have that feature). Soon, deaf and hearing-impaired people will have the advantage of seeing the dialog and plot of television shows without an additional box, thanks to an improvement made by Motorola.

Embedded processors are smaller, more specialized versions of the CPUs you see in standard computers. There are hundreds of millions of items with CPUs from Motorola's 6805 line (there are over one hundred models with different features). Last month, Motorola upgraded their mainline television processor, the 68HC05T2, to allow it to automatically read the decode and display closed-caption programming. The new CPU, the 68HC05CC1, also gives better on-screen characters.

Closed-caption text is transmitted with many programs aired by networks and independent producers. Few televisions have the capability of displaying the captions: you must buy a separate box that hooks into your television for this capability. The boxes are expensive and are not compatible with all televisions. Because of this, Congress passed a law in 1990 that requires all televisions manufactured in or imported to the US (larger than 13") to include closed-caption decoders by July 1993.

The Motorola chip is essentially a standard CPU with special functions. It runs at 4MHz and comes with 16K of software. Motorola was able to extend the current chip to add these capabilities at a very low cost. The old chips sell for about $6 each; the new ones with closed-captioning cost about $7. Thus, you should see the televisions with closed-captioning costing almost nothing more than the current models. So far, Thomson Consumer Electronics (makers of RCA televisions) and Philips Consumer Electronics (makers of Magnavox and Philips televisions) have adopted the new CPU, and other companies (including some Japanese companies) will probably do so in the near future. Just as the computer industry often flocks wholesale towards newer, better CPUs, it is likely that the television industry will as well.■

Technology News From Japan

(Excerpted from the weekly news digest of Japan Marketing Group, 400 Groveland Ave., Suite 312, Minneapolis, MN 55403, 612/871-7889. JMG covers products and events in the Japanese computer industry.)

•**SEGA Enterprises** will sign an agreement with General Electric to cooperate in game software development. The two companies have already been working together on computer graphics boards, and they hope to integrate SEGA's game software expertise with GE's simulation technology.

•**Kaleida,** the multimedia development firm cofounded by IBM and Apple, is in the process of negotiating with eight Japanese firms concerning partnerships. The companies include Hitachi, NEC, Matsushita Electric, Sony, Sharp, and Toshiba. The purpose of these negotiations is to create international standards for multimedia data processing systems and computer software specifications.

•**WordPerfect Japan** shipped its Japanese-language versions of WordPerfect 5.1 on August 20. Versions of WP 5.1J for the Toshiba J-3100 Series and the IBM DOS/V systems are currently available, and an IBM PS/55 version is scheduled for September release. The planned Macintosh version, originally scheduled for third-quarter shipment, has been delayed until the fourth quarter to ensure compatibility with KanjiTalk 7.

•**Yokogawa Hewlett-Packard,** which currently has about 10% of the inkjet printer market, has beefed up its sales force and entered into a distribution agreement with Ryoyo Electric to target large firms. YHP plans to increase its monthly sales of the printers from twenty thousand to sixty thousand units per month within the next year.

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Wayne Hodgins
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Group Manager, Autodesk
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Ernest Ganas, MBA
Microsoft Consultant
Wednesday, Nov. 18
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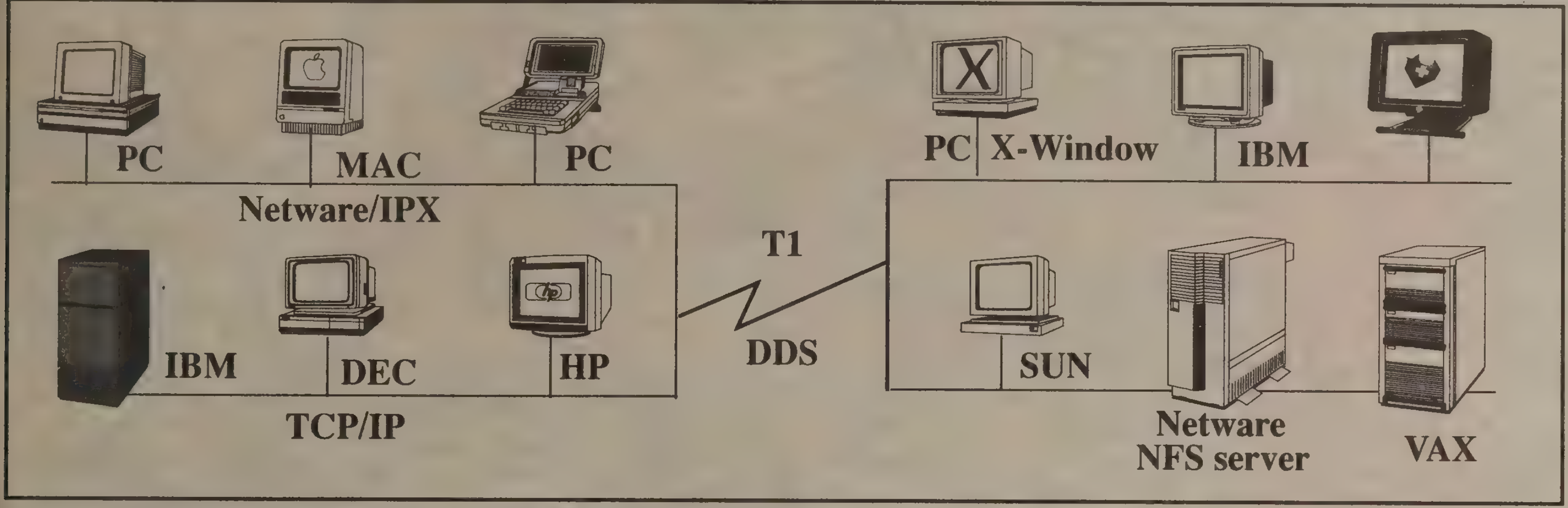

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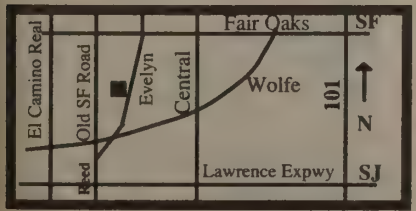

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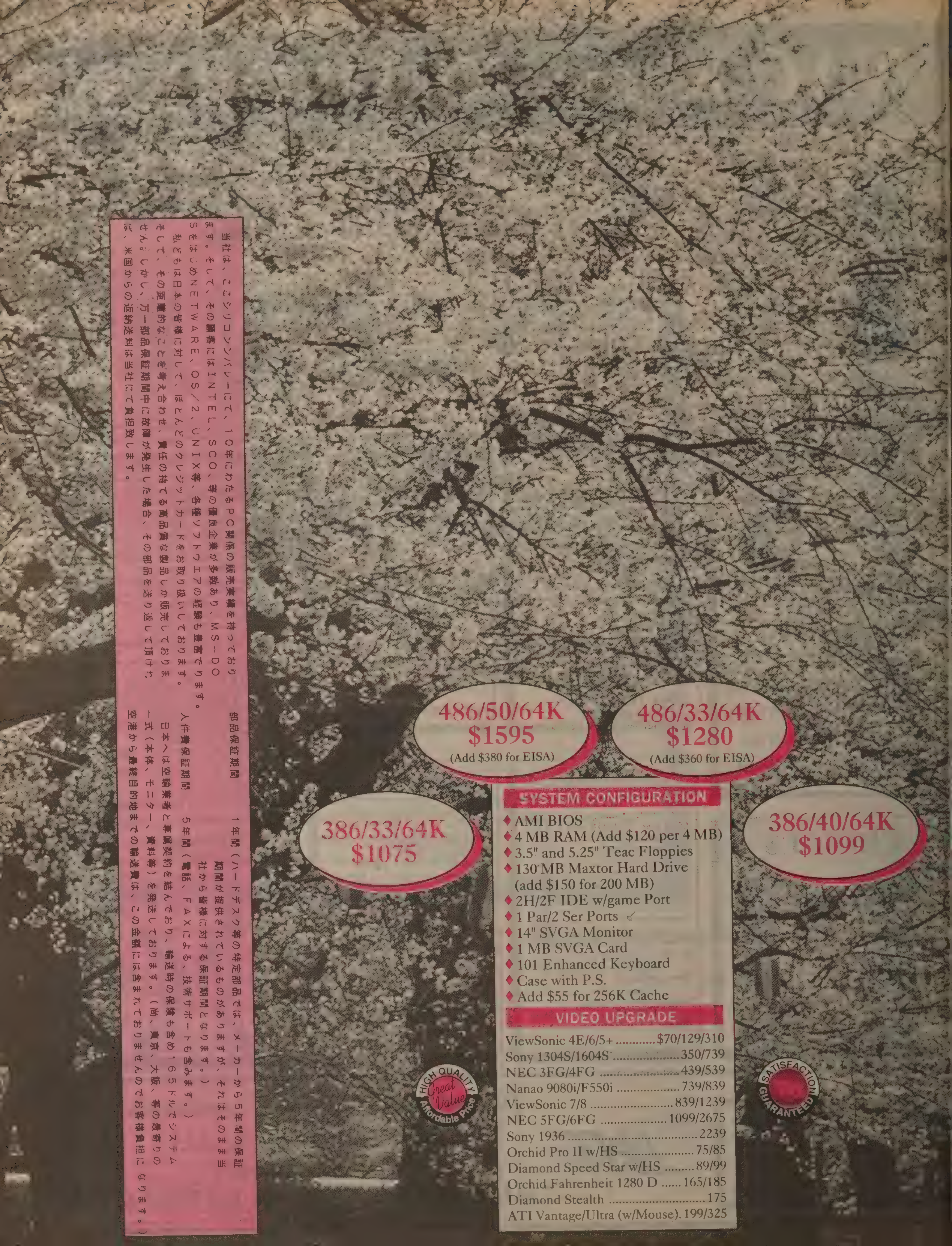

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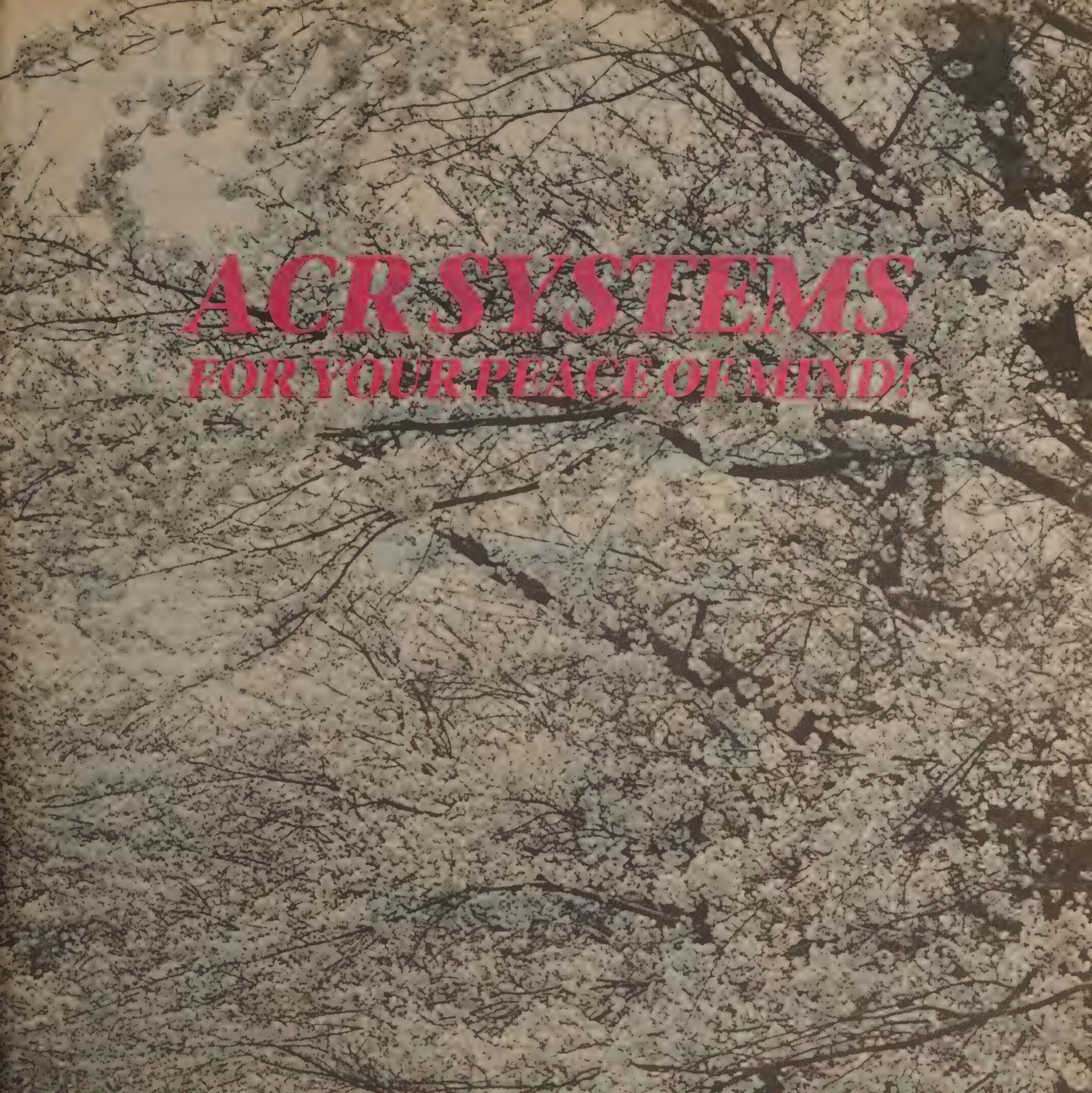

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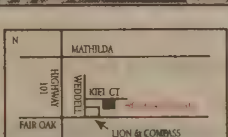

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Continued from page 38

services and checking for messages would be similarly straightforward.

OTHER PEN TECHNOLOGIES

Aside from the Newton, there are currently two major, open pen-based operating systems: GO Corporation's PenPoint and Microsoft's Windows for Pens. At first many industry observers felt the two operating systems would have markedly different target audiences, but as developers have been working with these two dominant operating environments for pens, most have come to the opinion that they should write versions of their applications for both operating systems. Most pen-based computer platforms on the market today will run both operating systems, and many pen-based software developers seem to be writing their applications for both platforms.

One of the advantages of Microsoft's Windows for Pens is that not only will it run truly "pencentric" applications, but it will run any standard Windows application as well. Naturally, using a standard Windows app on a pen computer may seem rather awkward, since it was not designed for a pen interface, so most people consider this a rather minor advantage. Nevertheless, it is a rather convenient feature, and allows users of Windows for Pens to be able to run any of their standard Windows applications should they so choose.

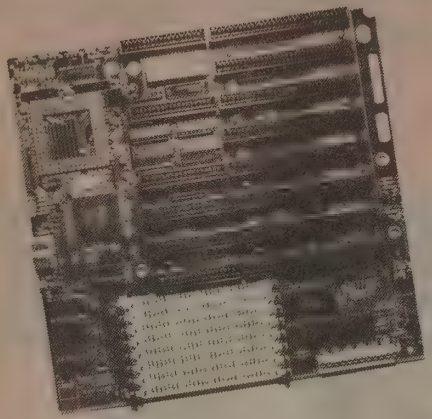
PenPoint is an object-oriented architecture, and from an engineering standpoint is somewhat more sophisticated than Microsoft's offering. However, time will tell whether the modest engineering advantages of PenPoint's system will translate into significant power or markedly improved ease of use. At present, most software vendors seem to be taking the attitude that they will be able to develop their applications "portably"; this means they can write applications for both environments without significantly changing their functionality.

Unfortunately, Windows for Pens and PenPoint do not use the same gestures for the various operations (such as cut, copy, paste, delete, and so forth), meaning that users switching between the two environments might become a bit confused. The situation is complicated by the fact that there are a number of other pen-based environments on the market, including GRiD's PenRight operating system, Momenta's Smalltalk-based system (although this system is currently in great doubt since Momenta has run into serious financial difficulties), Communication Intelligence Corporation's PenDOS 2.0, and, of course, the Newton system, which could well eclipse all the others.

THE NEWTON CHALLENGE

The big question for both pen and palmtop computer vendors is whether or not they will be able to release hardware and software systems that will be competitive with the Apple Newton at the time of its initial release (supposedly by first quarter next year).

Welcome on board!!



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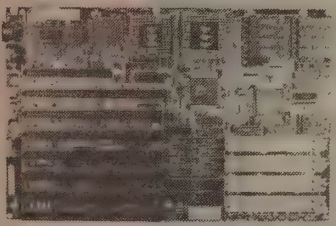
Landmark	V1.14	64.9	*113.2*	MHz
Checkit	V3.0	9747	*12054*	Dhystones
Qaplus	V4.52	11379	*15172*	Dhrystones
Cache Size		64K	*0K*	Byte
Cost With CPU *		$175	*$175*	USD

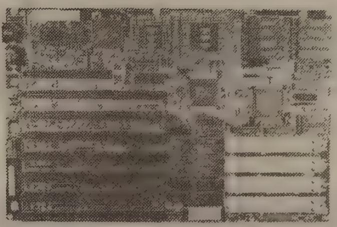
*Estimated in July, based on minimum quantity of 100 units.

Let's talk about boards,



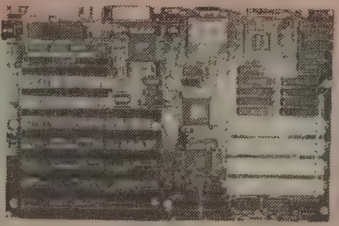
486DX-50(AT450)

CPU:80486-50
CHIPSET:SIS
CACHE:64/128/256/
512KB/1MB
BIOS:AMI
BOARD SIZE:BABY
SLOTS: 8



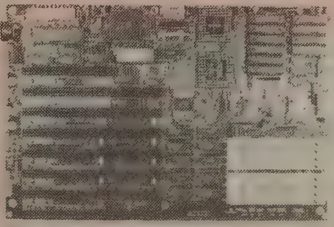
486DX-33;SX-25/ 20(AT433)

CPU:80486DX2-50/66
CHIPSET:SIS
CACHE:64/128/256/
512KB/1MB
BIOS:AMI
BOARD SIZE:BABY
SLOTS: 8



386DX-40/33/25(FU333)

CPU:80386-40/33/25
38605-40/33/25
CHIPSET:CHIPS AND TECH.
CACHE:64/128/256/
BIOS:AMI
BOARD SIZE:BABY
SLOTS: 8

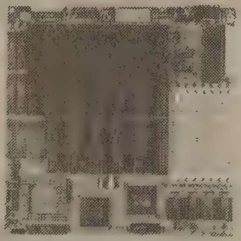


386DX-33/25(FS333)

CPU:80386-40/33/25
CHIPSET:SIS
CACHE:64/128/256/
BIOS:AMI/AWARD
BOARD SIZE:BABY
SLOTS: 8

486-50/33 EISA(AE4)

CPU:80486-50/33
CHIPSET:SIS
CACHE:64/128/256
BIOS:AWARD
BOARD SIZE:BABY
SLOTS: 8



486DX-50/33;486SX-25/20(AX4)

CPU:80486DX2-50/66
CHIPSET:SIS
CACHE:64/128/256/
BIOS:AMI/AWARD
BOARD SIZE:HALF
SLOTS: 7

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- 512K SVGA Card
- Mini Tower or Desktop Case
- 285W Power Supply

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- Maxtor 130MB 15NS Hard Drive
- 101-Key Enhanced Keyboard
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- 512K Card (1MB for Local Bus)
- Mini Tower or Desktop Case
- 200W Power Supply

Options

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- Add $30 for Non-Interlaced Monitor
- Add $20 for 1MB SVGA Card
- Add $100 for 200MB Hard Drive

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386-40/64K CACHE	$918
386-33/64K CACHE	$908
386DX-25	$888
386SX-25	$798

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- AT I/O 2S/1P/1G
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- 101-Key Enhanced Keyboard
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- 512K SVGA Card
- Mini Tower or Desktop Case
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486DX-50C EISA	$798	$978	$1,224	$1,348	$1,388	$1,442	$1,496	$1,658	$1,708	$1,758
486DX-33C EISA*	648*	818*	1,064*	1,188*	1,228*	1,282*	1,336*	1,498*	1,548*	1,598*
486DX-50C ISA	618	788	1,034	1,158	1,198	1,252	1,306	1,468	1,518	1,568
486DX2-50C ISA	556	716	962	1,086	1,126	1,180	1,234	1,396	1,446	1,496
486DX-33C ISA*	416*	584*	830*	954*	994*	1,048*	1,102*	1,264*	1,314*	1,364*
486SX-25C ISA	192	352	598	722	762	816	870	1,032	1,082	1,132
486SX-20C ISA	172	338	584	708	748	802	856	1,018	1,068	1,118
386DX-40/64C	162	322	568	692	732	786	840	1,002	1,052	1,102
386DX-33/64C	158	316	562	686	726	780	834	996	1,046	1,096
386DX-25	140	300	546	670	710	764	814	980	1,030	1,080
386SX-33	114	278	524	648	688	742	794	958	1,008	1,058
386SX-25	94	258	504	628	668	722	774	938	988	1,038
386SX-16	88	254	500	624	664	718	770	934	984	1,034
286-20	68	226	472	596	636	690	744	926	976	1,026
286-16	60	218	464	588	628	682	736	918	968	1,018
286-12	47	208	454	578	618	672	726	908	958	1,008

BASIC SYSTEM CONFIGURATION:
Motherboard & CPU, 1MB (512KB for 286 systems) memory installed, 1:1 2HD/2FD controller, 1.2MB or 1.44MB Floppy Drive, Internal Clock/Calendar, Enhance Case with Power Supply, and 101-Key Enhanced Keyboard.

* Due to market conditions please call for current prices.

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Diamond Speed Star 24 w/ Hi-Color	138
Diamond Speed Star 24X w/ Hi-Color	164
Diamond Stealth VRAM	204
Orchid IIs w/ 1MB (w/SYS)	118
Orchid IIs/Hi-Color (w/SYS)	124
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ATI Graphic Ultra w/ Mouse	328
Nanao 9070u (16", 1024•768, 0.28)	768
Nanao 9080i (16", 1280•1024, 0.28)	920
Nanao F550i (17", 1280•1024, 0.28)	1,030
NEC 3FGX (15", 1024•768, 0.28)	624
NEC 4FG (15", 1024•768, 0.28)	734
MAG 15H (15", 1280•1024, 0.28)	588
Sony CPD 1304S	544
Sony CPD 1604S	998
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HITACHI CM-2085M+ (20")	1,376
HITACHI CM-2187M (21")	2,288
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TOSHIBA P21CM00 (21")	2,034
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Super VGA (1024•768) Monitor 0.28	255
Super VGA Non-Interlaced Monitor 0.28	285
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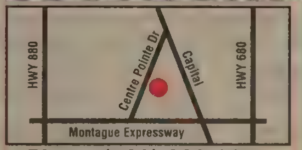

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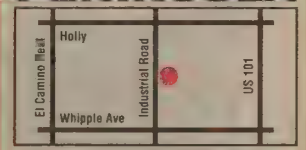

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At present, pen-based computers are being sold at far above Apple's projected target price, and most other palmtop computers are much less powerful than the Newton will be.

The announcement of Apple's new technology has apparently already spurred other manufacturers to accelerate and modify their pen-based and palmtop technical development plans. Until now, palmtop computers had been heading in the direction of becoming more and more like tiny DOS-based PCs; the Newton has opened up some new thinking in the industry (according to rumors I've heard), causing manufacturers to reevaluate their plans. This will probably push palmtop computers increasingly toward unique, specially crafted designs.

IN OTHER NEWS

The Newton has opened up some new thinking in the industry, causing manufacturers to reevaluate their plans.

Sharp Corporation is planning to start shipments of its new palmtop organizer, the OZ-9600, before the end of this year. The 9600 is an upgraded and more powerful Wizard that includes pen input. Sharp's Wizard line has been immensely popular (in fact I own an OZ-8000 myself). The OZ-9600 includes a number of improvements on the earlier Wizards, including pen input, a touch screen, multitasking, and wireless communications. According to Sharp, the 9600 incorporates the same technology as used in the PV-F1, an organizer that was introduced in Japan last May.

Unlike previous Wizards, the OZ-9600 features a graphical user interface with icons, windows, menus, and cut/paste capabilities, reminiscent of the Psion 3. An "electronic scrapbook" allows hand-written letters and graphics to be entered into the system. The OZ-9600 is equipped with a "wireless communications" system, which I presume is something infrared-based, which allows OZ-9600s to exchange information via a wireless link. Pricing is still as of yet unavailable. I will be doing an extended review of this unit as soon as I can get one.

Way To Go Corportation, a Berkeley-based company, has developed a system that would allow specially equipped portable computer users to receive specific, real-time traffic updates via radio frequencies, using a variety of radio bands such as paging channels, FM radio sidebands, mobile radio channels, and cellular data frequencies. Way To Go has set up relationships with a major traffic center operator, allowing them access to a variety of traffic information sources, covering the entire freeway system in each supported metropolitan area. In the Bay Area, for example, Way To Go plans to cover an area from Santa Rosa to Livermore and from Fairfield to San Jose. The technology would be licensed to portable computer manufacturers, and it will also be available via their own proprietary portable device which would measure 2.5" x 5" x .5".■

Next month: A look at the HP 95LX.

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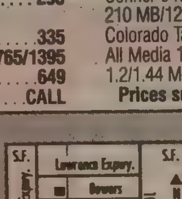

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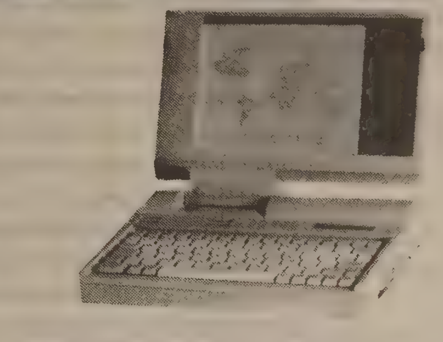

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Continued from page 52

thousand employees actively telecommuting at least one day a week, and the number continues to grow.

Part of the pressure toward telecommuting in California comes from the need to cut down on the number of commuter trips that employees make every work day. The advantages of telecommuting include improved air quality; better energy conservation; higher employee productivity, morale, and effectiveness and lower health costs and absenteeism.

Telecommuting also tends to improve a manager's or supervisor's skills, simply because he or she can no longer check on the employee just by looking over the cubicle wall. Telecommuting tends to put a greater premium on developing work goals and objectives and using them to help measure the telecommuting employee's results. This helps the manager and the employee do a better job. Smart managers are beginning to apply the same management skills to their non-telecommuting workers to get even greater companywide productivity improvements.

TELECOMMUTING AND TRANSPORTATION

Because telecommuting is seen as part of the effort to reduce the statewide number of "employee commute trips," telecommuting studies and initiatives in California are tied to the state's transportation management program. For example, Caltrans recently contracted with the University of California at Davis to develop as many as twelve "residential-based telecenters" in Orange County, San Diego, and the Sacramento region, and to evaluate their effectiveness in promoting and supporting telecommuting. Responding to transportation management incentives and regulations, Pacific Bell—a private corporation at the forefront of telecommuting experiments and program support—is also part of a consortium developing one or two private telecenters in the Interstate 580/680 corridor in and around San Francisco. (We'll discuss these telecenters in more detail in a forthcoming article.)

The US Congress is presently considering legislation that will follow and expand upon the California lead. For example, House Resolution 5082 would allocate $5 million to develop telecenters in and around Washington, DC. A number of legislators, most notably Senator Al Gore, are promoting the development of a nationwide fiber optic network that would greatly facilitate more and better technologies in support of widespread telecommuting.

Senator Conrad Burns (R-Montana) is working on a telecommuting bill that would seek to provide incentives for more widespread telecommuting and also ease restrictions and smooth out existing legislative and administrative obstacles. In general, these

TELECOMMUTING AND TECHNOLOGY

Technology is an interesting filter through which to examine telecommuting because many people believe that telecommuting and technology are nearly inseparable. Yet the truth is a person needs only a telephone and the skills to use it to get started telecommuting and to be effective. However, there is a clear pattern of telecommuters using more advanced technology to help them stay in close contact with colleagues, managers, clients, and others with whom they must communicate.

Personal computers are particularly common. Some of the first employees to be given a trial in a company's initial telecommuting efforts are frequently people who normally work directly with a computer, such as computer programmers or graphics specialists. In addition, using a computer at home is one of the easiest and most effective ways to telecommute. That's why executives and other white collar employees will often save their computer work for the days they telecommute, and will use their time at the central office for meetings and other relatively low-tech activities. In fact, it's common for fledgling telecommuters to begin using a personal computer specifically to augment their productivity at home or at a nearby telework center. In addition, telecommuters tend to make frequent use of fax machines, modems, and cellular phones.

Because telecommuting is aimed at keeping people in close contact despite the distance between them—or as the slogan puts it: to move the work instead of the worker—today's advanced and super-advanced communications technology offers some very exciting opportunities.

Ironically, Northern Telecom's Ron Cross acknowledges that this nation's massive investment in copper wires, telephone switching centers, and other voice-oriented telecommunications infrastructure once made us the most advanced and productive country on Earth. But now he believes this existing infrastructure is holding us back from installing more modern technologies—including many that are totally proven—that would support telecommuting for millions of workers and make this nation more productive and innovative than ever.

To visualize this, consider how easily people today can converse over any distance, and how common it is to use computer networks or fax to exchange documents in electronic or image form. But if we were free to use currently available technology to build a new public communications infrastructure, we could have faster, more powerful connections that would allow us to include voice, music, and image information along with an ordinary letter or report. Within private networks—such as Northern Telecom's—these modern technologies make it comfortable for telecommuters to dialog across vast distances not only by voice, but by using a variety of information formats.

For example, within some corporate networks, small video cameras mounted on top of the computer monitors allow compressed, almost full-motion pictures to be transmitted between two people talking by telephone. Having a picture of the other person's face, and a view of at least his or her upper-body language greatly enhances the power and immediacy of the information exchange. The camera also allows people to share video images of a product or image.

J. Ron Cross, director of regulatory policy analysis for Northern Telecom, in Nashville, TN, is quick to point out that the Japanese are experimenting with even more advanced technologies. For example, experimenters there are extending virtual reality concepts into business communications, and developing a virtual workspace where two or more people can appear at the same table without leaving their respective offices, and without strapping themselves into gloves and helmets as experimenters now do. With such equipment, a company could assemble teams of workers and have them "meet" as often as necessary regardless of where the individual team members lived or worked. They could even "handle" a product that existed only as a computerized design and a set of manufacturing specifications.

Although at present the visual clarity is unacceptable for commercial applications, within five years the image and sound may be as sharp and three-dimensional as a television picture is today.

— Robert Moskowitz

telecommuting advocates suggest that years ago a highway system helped centrally located states become more productive and economically active in the manufacturing and distribution industries. Today, an "information highway" can provide the same kind of stimulus and basis for less well located states to support throngs of telecommuting workers, and thus to become more productive in a service industry.

Already many large firms have their phones answered in Kansas or another remote location. They could just as easily have their graphics, advertising, market planning and analysis, and other information-intensive activities done by telecommuting workers equipped with advanced technology and supported by tomorrow's "information highway."

TELECOMMUTING TENDS TO IMPOVE A MANAGER'S OR SUPERVISOR'S SKILLS. HE OR SHE CAN NO LONGER CHECK ON THE EMPLOYEE JUST BY LOOKING OVER THE CUBICLE WALL.

But problems and impediments remain, such as the complex and difficult to resolve issues of worker's compensation, and of payroll and unemployment tax. The problem is that telecommuting makes it easy for an employee to work in one state while his or her employer operates in another. Where are various taxes due? How can the parties avoid double taxation? Such questions have no clear answers as yet. Federal and state regulators are looking at possible changes to eliminate these difficulties and make telecommuting a more viable, large-scale option.

BENEFITS

Generally speaking, telecommuting delivers three separate sets of benefits: social benefits, business/management benefits, and employee benefits.

The social benefits include such concerns as better air quality, lower energy usage, reduced commuter traffic, and improved job opportunities for those in remote locations or with mobility restrictions.

The business/management benefits include higher levels of employee effectiveness, productivity, and motivation, as well as reduced overhead expenses and absenteeism. According to Ron Cross, of Northern Telecom, "Any place where telecommuting has been deployed to date, productivity and motivation have been enhanced. One of the real barriers to introduction of it in the corporations has been the concern of managers that 'Gee, I don't really know what Ron is doing at home.' Yet no one has found an area where telecommuting has reduced productivity."

In addition to productivity and motivation improvements, telecommuting gives an organization the ability to recruit employees with relatively scarce talents from a wider pool and a larger geographical area. When a company relocates, key employees need not stay behind. And when a key employee's spouse takes a better job, the change need not disrupt the family's other existing employment and responsibilities.

For the employee, the benefits of telecommuting translate directly and immediately into more discretionary time, more time with the family, less stress, and general health improvements. Commuting costs are much lower, and telecommuters tend to feel more in control of life than employees who travel to the same (distant) office five days a week.

REORGANIZING YOUR WORK

However, telecommuting experiments, pilot programs, and full-scale programs have shown that an employer cannot just kick an employee out the door and expect him or her to become a successful telecommuter. Managers must analyze each job considered for telecommuting to see which of its tasks absolutely must be done at the central office and which ones can be done from a distance. Sometimes, the employee and supervisor must brainstorm to find another way to do the job or segment the responsibilities so the employee can work productively at home or at a telecenter one or more days a week. Examples of successful adaptations to the demands of telecommuting abound.

Even prior to telecommuting, one California Public Utilities Commission manager/supervisor had difficulties with specialists who would go on vacation and temporarily leave the office with no expert in a particular area. When telecommuting was proposed, everyone feared it might aggravate this problem. However, the PUC decided to handle the conversion to telecommuting by having specialists in the main office rotate to cover for those who were working at home. After a while this approach helped the entire staff become cross-trained in each other's specialties, making coverage during vacations much less of a problem.

In many offices, employees restructure their activities to accommodate telecommuting. For example, instead of using a few paper-based files every day, people save up work with paper files and do it during the days they are in the central office. Managers, too, can adapt. Those who like to "call a quick meeting" can learn to put distant telecommuters on a speaker-phone or a conference call with those who are in the office.

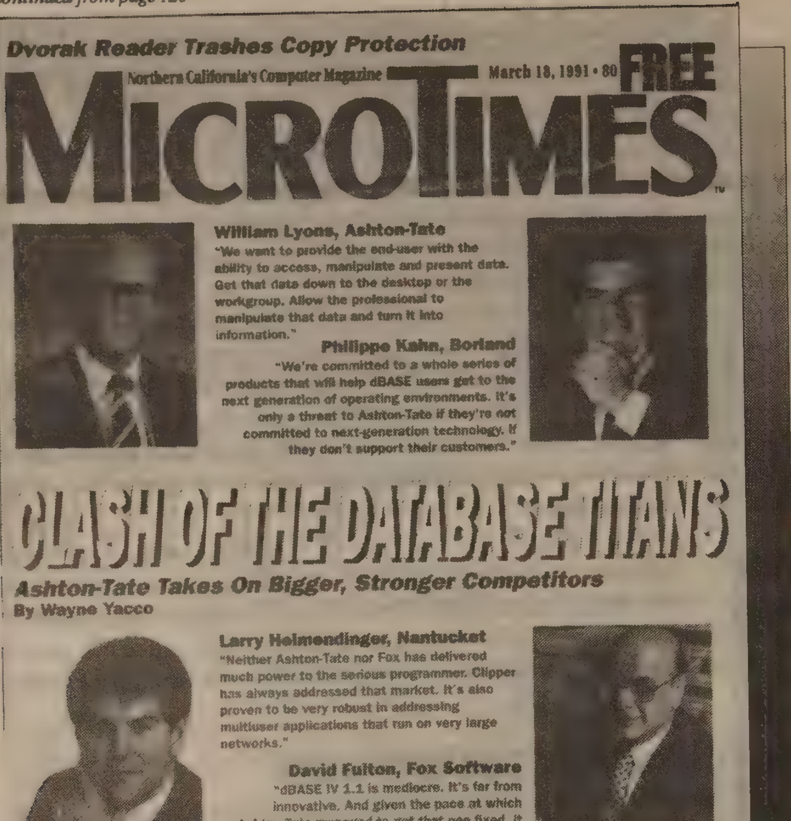
Although it's difficult to establish and maintain a good working relationship by telephone and fax, experience shows that once a telecommuter meets someone in person and gets to know them, they can accomplish much of their work without frequent face-to-face contact.

THIS IS JUST THE BEGINNING

Obviously, telecommuting is still in its early stages. But industry is beginning to understand it, and under pressure from federal and state clean air legislation as well as from economic forces, more and more companies are seriously looking at the telecommuting option.

Although telecommuting will never be right for every employee, it will certainly become more widespread. Many proponents feel that once California industry learns how to initiate and support telecommuting successfully, companies in other states will be likely to follow our lead. ■

Continued from page 120



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CLASH OF THE DATABASE TITANS

Ashton-Tate Takes On Bigger, Stronger Competitors
By Wayne Yacco

Larry Heimendinger, Nantucket
"Neither Ashton-Tate nor Fox has delivered much power to the serious programmer. Clipper has always addressed that market. It's also proven to be very robust in addressing multiuser applications that run on very large networks."

David Fulton, Fox Software
"dBASE IV 1.1 is mediocre. It's far from innovative. And given the pace at which Ashton-Tate managed to get that one fixed, it doesn't leave me optimistic about their ability to respond to threats."

ALSO: DBEXPO Preview • Lotus Withdraws MarketPla

ISSUE #80 MARCH 1991

Cover story by Wayne Yacco
Clash Of The Database Titans

William Lyons, Ashton-Tate: "We want to provide the end-user with the ability to access, manipulate, and present data. Get that data down to the desktop or the workgroup. Allow the professional to manipulate the data and turn it into information."

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In the ensuing months, the database landscape changed beyond recognition, and three of these four CEOs are now elsewhere.

Ashton-Tate was acquired by Borland, Fox by Microsoft, and Nantucket by Computer Associates.

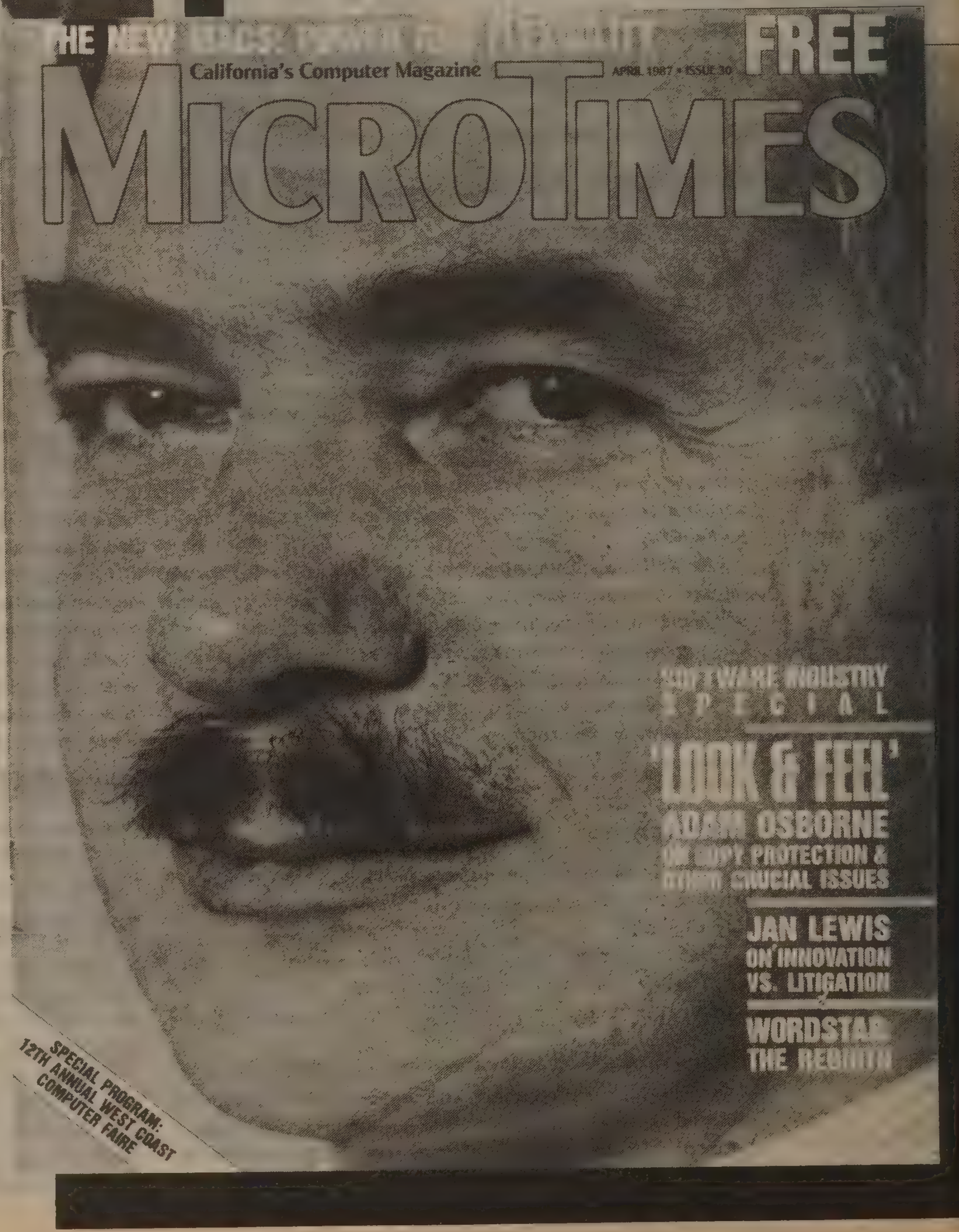
ISSUE #30 APRIL 1987

Look And Feel: Adam Osborne

"In this country lawyers are the sand in the machinery of our industry. The law in this country is, next to the Mafia, the most disastrous part of our society. I have dealt with lawyers and been involved in a certain amount of litigation, and frankly I think that most of them can be classified as gangsters, in terms of their ethics and mental attitudes toward what they're doing. They're amoral people who really care about nothing except playing a game which is of no value to society whatsoever, mostly only of value to lining their own pockets. But that's what we have to put up with, you see....

"At the time Lotus filed the lawsuit, my reaction was 'I am ecstatic. I'm dancing off the roof. I didn't think that Lotus could be so foolish.' And this morning in the *New York Times* Mr. Sanger reports that some senior Lotus executives admit privately that they have been rather amazed by the reaction to the lawsuit. I am not. I think that they were foolish to do it, I am sure that we will prevail, but beyond that there is not much I can do or say about the case."

Well, Judge Keeton didn't exactly see it that way, as things turned out. By the time the decision favoring Lotus in Lotus vs. Paperback Software *was handed down, Osborne himself was long gone from the company. In the lawsuit's aftermath, Paperback's bestselling spreadsheet VP-Planner was withdrawn from the market, and the company collapsed shortly thereafter.*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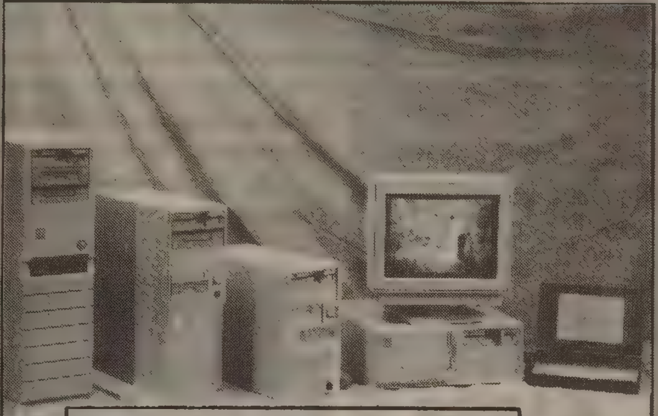

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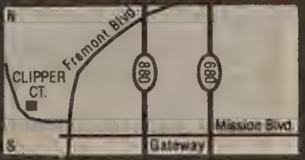

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Continued from page 60

SETTLEMENT VALUE

Structured Settlement-Economist, by Advocate Software, Inc. computes the present value of a proposed settlement. It also structures settlements based upon the client's financial needs. For example, there may be tax motives to structure the timing of receipts. While accountants use a variety of software to compute annuities and present values, Structured Settlement is tailored for this purpose in the legal realm.

A related, more expensive package ($395) is Determining Damages: Structured Settlements, by Shepard's/McGraw-Hill. This software calculates the present value of future lump-sum payments as well as annuities. Like Advocate Software's product, it evaluates the present value of uniquely structured settlement schedules.

TWO PROGRAMS THAT PERFORM TAX AND FINANCIAL ALLOCATIONS BETWEEN SPOUSES ARE DISSOMASTER AND DIVORCE PLANNER.

Three packages compute damages based upon built-in tables and database information. Economic/Hedonic Damages System, from Anderson Publishing Co., computes damages based upon factors which are laid out in an accompanying book. Case Evaluation/Basic Settlement Value Software, from JVR Software, factors in inflation and litigation costs. (A variety of add-ons and enhancements are also available from the vendor.) Total Life Care, from Compensation Economics Information Services, is the heavyweight of the lot, costing $1699. It factors in age and other demographic facts, actuarial expectancies, and labor-market factors. It also takes litigation costs into account.

Backpay and Frontpay are Lotus 1-2-3 templates. They compute damages from lost wages by applying a variety of factors, such as actuarial factors and interest rates. They cost only $55 each.

A variety of programs are available for separation and divorce. This includes business valuation software. Appraising a family business leaves much to subjectivity. As a starting point, some judges may give more credence to software, which at least has been programmed by a disinterested party.

A similar lack of independent appraisal occurs when allocating tax attributes between spouses. At least in California, I've heard that some judges almost seem to prefer a printout from a familiar software package to hearing tax arguments from divorce lawyers. Two programs that perform tax and financial allocations between spouses are Dissomaster and Divorce Planner.

Business valuation for divorce purposes may vary considerably from valuation for other purposes, so it's important to check that the software employs assumptions which are valid for state equitable distribution laws.

An important aspect of small business valuation is client or courtroom presentation. Business Valuation With Rations and Graphics computes values based upon a selection of widely used techniques. In addition, it generates graphics and charts to strengthen your communication.

OTHER SOURCES

This article considers only a small fraction of available software tools for the attorney. A comprehensive guide, *Computers for Lawyers*, by Paul Bernstein, J.D. focuses on how to evaluate and set up a computer system to meet a firm's specific practice needs. It includes practice and case management, accounting software, litigation support software, and databases. The book endeavors to take into account a diversity of law firms, including those that have never used a computer. ■

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486SX-20	180	350	605	780	990	1130
386-40 W/64K	170	335	580	770	975	1100
386-33 W/64K	165	330	575	765	970	1095
386-25 DX	140	305	550	740	945	1070
386SX-25	100	265	510	698	910	1030

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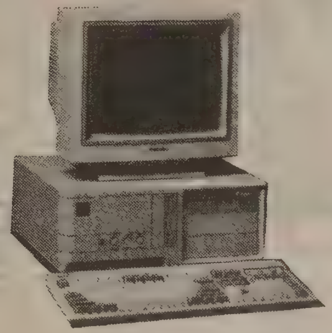

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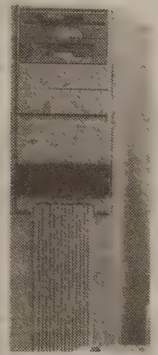

SYSTEM UPGRADES

AT I/O (2S/1P/1G)	11
Serial card/Parallel card/Game card	11
IDE 2FD/2HD	13
IDE 2FD/2HD with 2S/1P/1G	18
Ultrastor SCSI 14F (ISA)	225
Ultrastor ESDI w/32K Cache (ISA)	154
Ultrastor SCSI 24F (EISA)	448
Ultrastor ESDI 22F (EISA)	448
Adaptec SCSI 1542BK w/Kit (ISA)	248
Tseng Lab VGA w/1MB	95
Fax Modem (9600 Fax, 2400 Modem)	58
2400 Int. Modem	34
Serial Mouse	14
CYRIX 387DX-40/33	124/96
CYRIX 387SX-25	88
Windows 3.1	38
DOS 5.0	38
Power Center	15
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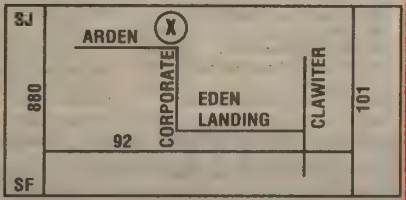

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	4MB	159.00
T1200EX,T1600,T3100E	2MB	109.00
T3200	3MB	169.00
T5100	2MB	109.00
T5200,T5200C,T8500SL	2MB	109.00
	8MB	349.00
T3100	2MB	239.00
T4400,T6400,T3300SL	2MB	199.00
NEW	4MB	319.00
T3300SL	6MB	495.00
T4400,T6400	8MB	729.00

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Portable LTE386S/20	1MB BD	179.00
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SLT/286	1MB BD	99.00
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SLT/386	2MB BD	189.00
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Prospeed SX/20	1MB BD	159.00
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Prospeed 286	1MB BD	139.00
386SX/16	2MB BD	259.00
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	ALPHA 2MB	149.00
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TiTM2000	1MB BD	129.00
TiTM3000	2MB Kit	129.00
Everex Templ LX	2MB MD	159.00
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Mac IIsi	8MB Kit	469.00
Mac IIci,IIsi	16MBKit	599.00
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Mac SE,SE 30, Plus, II, IIcx,IIx	4MB Kit	189.00

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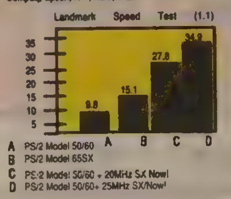

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Continued from page 78

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Christine Eyre
Manager
Market & Business Development
CenterLine Software
Wednesday, 9:45 am–10:45 am

The Case for CASE

Cynthia B. Padnos
Director Core Partner Marketing
Interactive Development Environments (IDE)
Wednesday, 2:00 pm–3:00 pm

The Interleaf Solution to CASE Documentation Challenges

Heidi Daitch
Business Development Manager
Interleaf
Wednesday, 3:15 pm–4:15 pm

How to Manage Team Software Development

Steve Lehto
Manager Configuration Management Support
INTERSOLV
Thursday, 8:30 am–9:30 am

The PROCASE Solution for Source Code Engineering

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Vice President Marketing
PROCASE
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Paula Phelan
Manager Product Marketing Software Management Products
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Michael Foody
President
Visual Edge Software Ltd.
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Senior Product Marketing Manager
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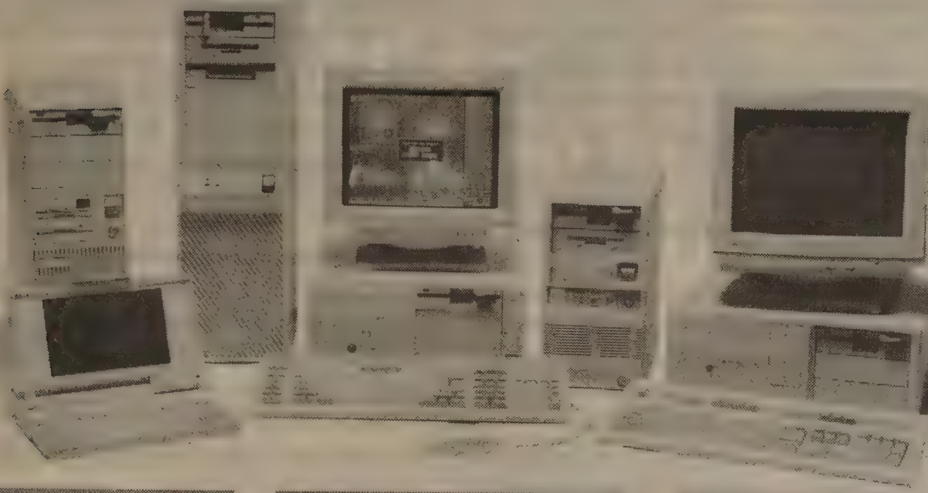

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Continued from page 112

concerned with is accelerating that process, as new technology becomes available, of getting to that third stage, so we can begin to exploit it for its own benefits.

But there's that cultural problem, though, especially in an era when people feel like they're all on the Learning Curve of Sisyphus—when technology is developing faster than anybody can learn it. I felt an incredible amount of fear in your conference the other day. They were all so uptight.

They *were* earnest.

They could see all these things converging. It was as though they looked up and saw five safes about to fall on them, and they don't know which way to duck. Aside from saying unhelpful things like "Let us have faith," I don't know how to address that problem.

The problem is aggravated by the way in which technology gets implemented. There is no excuse for a VCR being so difficult to program. There is simply no excuse for that.

And there are lots and lots of similar examples. Most of the software programs we get are godawful from that respect. They simply are not well implemented from a human standpoint, but it's damned difficult to do that right.

But there are also situations where, as a society, we get the paradigms wrong. One example of this that I really had trouble with, starting in the mid-'70s into the '80s, was what was happening at the beginning of the personal computer revolution.

The things that were wrong with the personal computer from the beginning were embodied in its name. It was "personal," and it was a "computer." It shouldn't have been either of those things. People work collaboratively, and personal computers were brought to us by people who wanted to own their own personal computer. The early hackers wanted a computer to play with.

And so we went through this nonsense of computer literacy, thinking that we were going to have to train a whole new generation of kids to be computer programmers, and that we were going to have to adapt to computers.

Unfortunately, that folly is still kicking around out there.

To me, the objective always was that we should make the tools adapt to us rather than requiring us to adapt to the tools. It's taken us a long time to learn that.

It was a real moment of liberation to me when I realized, first of all, that there was no such thing as a computer, really, and second, there was no such thing as a computer expert. I mean, there were people who understood various forms of computer tools, and various ways of using them, but aside from reducing all work to ones and zeros, they had very little in common with one another.

Well, yes and no. The other side of that is that we keep reinventing ourselves, over and over again. One of the things that is striking to me, having worked with mainframe computers and minicomputers, and then personal computers, is seeing us go through the same evolution.

MS-DOS looks an awful lot like some operating system software I saw on some early mainframe computers. It basically is a control program, like the control programs we dealt with in the early 1960s on mainframes.

Yeah, it's a program to control technopeasants.

[laughs] So there is some computer culture here, and we keep reinventing the same things over and over again. It's interesting the way this happens, because this is so much of a young man's game that an awful lot of the people who are reinventing these things have no knowledge of the fact that someone else a generation before went through the same stuff.

Now that may be changing. It's interesting to see that the people at Microsoft and Apple, for example, are starting to learn to build on the previous experience rather than repeating the previous experience.

But it sure is up for grabs, isn't it?

That's what makes it so fun. The thing which makes this exciting, as far as I'm concerned—and this is the fourth decade I've been involved with applying this technology—is that each decade, as the technology gets better, we've been able to have a bigger and bigger impact on society. And each decade, because of that, we've gotten more and more players involved, the stakes have gotten bigger and bigger. It has gotten more confusing, more turbulent, and more exciting to be involved with. When it was a relatively niche sort of thing, and nobody cared about what we were doing, it was much safer than it is now. You were talking about people's fear at the Digital World conference—well, that's a product of the fact that now we're talking about changing *all kinds* of things, and people don't know where to turn. Now that's frightening, but it's also exhilarating.

If you have the right disposition. Some people look at chaos as an opportunity, and some people look at it as a catastrophe.

Revolutions are messy. People get hurt in revolutions. That's the nature of a revolution. But there is also tremendous opportunity in revolutions. I prefer to look at it from that side.

I also think that this isn't rocket science we're dealing with. The trends that we're talking about, the underlying forces at work here, are not that difficult to understand. The more we can do to help people open their eyes and look around them, to look up from their daily life and see what's going on around them, the more we can help them not get trampled by this.

That brings to mind the problem of datashock. It seems that with the democratization of information delivery, decision makers are being bombarded with more information than they can possibly assimilate. Their attention spans are being driven down to the microsecond range at this point. Do you think we're eliminating the editorial function in information delivery?

If we stayed with the status quo, we'd be in trouble, because things are moving more rapidly, there's more information coming at us. The result is that we all end up putting up defenses and filters to try to keep ourselves from being overwhelmed by this.

None of which are holding.

No. Now you're right that there is a crying need for help in organizing, rationalizing, making sense out of this. But I guess I cling to the belief that we need to have multiple sources for doing that.

I agree with you on the increasing need for the editorial input, but I really want to see more diversity and more variety in it.

On the one hand we know that the centralization of media has certain diabolical effects, but if everything turns into white noise, that might even be more corrosive to the political process.

What's the solution?

I don't know. I'm asking you because you're a smart guy and I thought you might have some thoughts on this. The problem is that information is that which has been found meaningful to you. Which means that somehow you have to actually process it yourself. Or have it preprocessed through a point of view you know and trust.

I read *The Economist* or the *New York Times* or the *Wall Street Journal*—I've got all these information sources I use, and I'm relying on them as filters. As organizers, as people to find information for and present it to me in a fashion that makes some sense. I choose the people I rely on based upon my experience with them and how good they are with doing that.

But I want to see a variety of those people. I want to see more variety, more divergent points of view presented that way. Because the danger of that is someone presenting to you a nicely coherent and packaged worldview, which becomes your worldview. I think it's important for all of us to be exposed to different worldviews, so we can assemble, out of all this what is, in the end, our own.

A lot of people don't want to do that. A lot of people want to simply incorporate somebody else's, whether it's Werner Erhard's or Jesus Christ's.

For years and years, in Europe, the tradition has been for partisan newspapers. And the result has been whole segments of the population who read *a* newspaper and get *a* slant on the news, and have very few points in common with someone who reads a different newspaper and a different slant on the news. They're actually operating from different factual bases.

Given my choice, I will lean on the side of chaos. I value diversity sufficiently that I will accept the price of some chaos to get that diversity.

Well, I'm with you on that! ■

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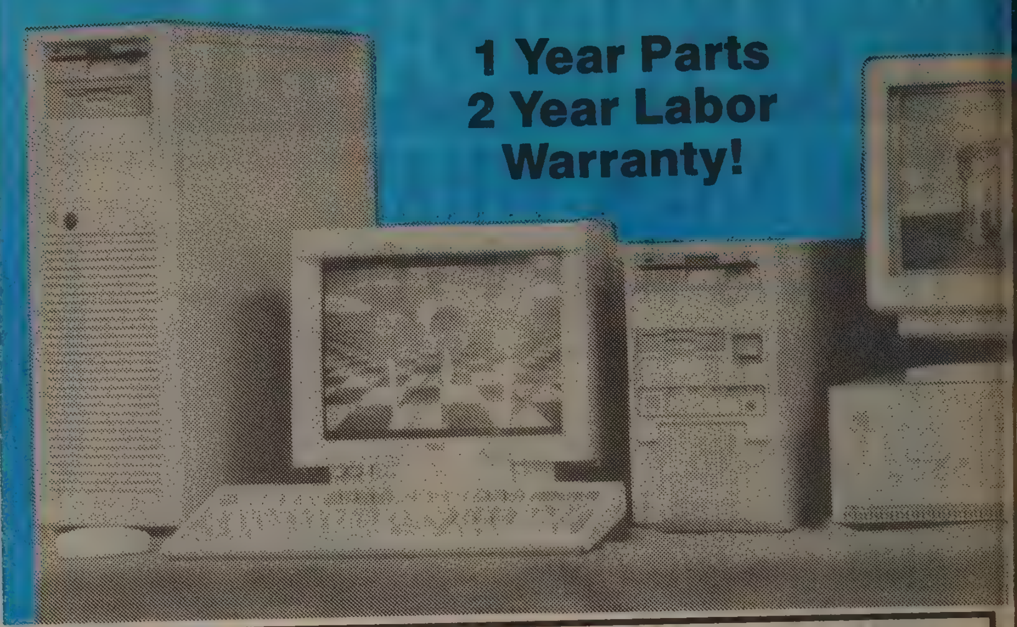

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Continued from page 132

interface, and what is a bad interface? Today there are software interfaces that range from abominable (UNIX's command line) to not-so-bad (the Macintosh). The really fine human-machine connection is still unborn.

Equipment Recycling: Since 1980, the computer industry has gone through several generations of hardware. Each generation has meant millions of cast-off machines. Nobody wants to have last year's box on their desk, so the machines are nearly useless.

Will MicroTimes still be a computer magazine in another one hundred years? Not as we know it today. At least I hope not.

Yacco

If you can find uses for them, your fortune is made. Try these: export to the developing world, ganging many machines together to build low-cost parallel processors, and low-cost automation.

Throughout the Public Broadcasting System, for instance, old-style 8086 machines with no hard disk are controlling the satellite dishes through which *Sesame Street* and *MacNeil-Lehrer* come to the American public. The software and hardware combined are much cheaper than the dedicated hardware satellite controls which they replaced. Modems, hardware control boards, and software languages all exist for these outdated machines. Most of the work has been done. What is needed is clever utilization.

Go for it, entrepreneurs!

YACCO

The next one hundred issues of this magazine are likely to make the publishers glad they chose *MicroTimes* as its name. As we head toward the end of the millenium, today's technology will evolve into radically different forms, and magazines with the word PC or computer in their name will seem increasingly irrelevant to the new majority of users.

The microcomputer won't disappear. It will be used by more people than ever before, but it will often be unrecognizable as the familiar personal computer. It's already about to begin submerging its personality into the first information appliances. These devices will have intuitive graphical interfaces, if not outright agents, and provide a whole new (and much larger) group of users with access to information and communications. The Newton, a figment of an Apple's imagination, will be one of the first, but there is a plenitude of alternatives on drawing boards and in labs. Sharp already sells a personal organizer in Japan with a graphical interface, and a version for the American market is in prototype (and will debut shortly). Radio Shack and Casio are building one too: the Trashio?

We'll be connecting computers together in a host of new ways too, not only for business, but for recreation with games like Velocity's Spectre and Maxis's RoboSport. The trend to wireless LAN adapters is growing. Proxim's RangeLAN is currently shipping at a breakthrough price, and Solectek's impending AirLAN will connect the ether to any IBM-compatible computer's parallel port. The ready availability of inexpensive switched-56K and ISDN service is all that's lacking to make wide-area networks common. Email and collaborative computing will drive connectivity into the streets too. Shiva's NetModems enabled mobile LAN extensions, or LONs (LAN Outer Networks), and they have been joined by the company's LanRover/L, as well as Centrum Communications' CentrumRemote Remote Access Server, and Microdyne Corporation's NetWare Access Server. The ARDIS and RAM packet radio networks are already in operation, and a network-specific modem, the Ericsson Mobidem, is available for the RAM network. Connect it to a fully functional, pocket-sized PC like the new Gateway2000 HandBook, and you can send email from almost anywhere (and at a nominal cost). The next generation of mobile modem is already off the drawing boards and nearing store shelves as well. Motorola and IBM will soon introduce a competitor that supports both RAM and ARDIS protocols, and serves as a bidirectional pager as well (with user-preprogrammed responses a single keystroke away).

But personal computers are going to do much more than find new ways to connect to each other. They will merge right into our televisions, telephones, and even our houses. In fact, all of these devices are likely to meld into connected systems that will help us communicate, recreate, educate, domesticate, and procreate.

Real agents will come to computers. They'll be the intelligent components that finally make computers do what we want them to do, and not just what we tell them to do. There's no reason why holography, and even virtual reality, can't participate in an interface role too. In a talk at the recent "Communicating the Future" symposium hosted by National Semiconductor, Nicholas Negroponte, founder and head of MIT's Media Lab, discussed innovations including agents (he maintains the desktop metaphor is too limited) and multimedia at the interface. His vision includes sporting events played out holographically on our living room floors by eight-inch-tall gladiators, and he says that the technology is nearly in the labs. Virtual reality won't just be on the Next Generation's holodeck, it will be on the bridge.

Hardware vendors will be joined by the communications industry and by electronic publishers too: one to provide the broadband distribution highways, and the other the masses of information these systems will allow us to consume. The communications industry made a strong showing in Beverly Hills this year, at Seybold's Digital World, with well-formed plans for switched digital, cable, and even interactive television systems. And emissaries of both camps showed their wares alongside the hardware vendors at the Mobile '92 conference in San Francisco.

The list of publishers readying electronic versions of their wares is already too long to list, and offerings will include books of all kinds, newspapers, graphics, video, sound, and interactive publications. Random House is even considering online-access subscriptions to its reference works in-progress. Imagine a dictionary every bit as alive as the language it describes. Electronic editions will eventually replace some publications entirely. If you must have hard copy, you'll simply pay an additional fee, and print it yourself.

As the trend toward an increasingly information-rich society continues, we'll find even better ways to prepackage it, and make it ready to consume. The prevalence of integrated appliances will increase. The bare processor, and discrete-component systems built around it, will become less common—except with the computing equivalent of audiophiles. A few computerphiles will continue to put custom machines together, but the majority will use preconfigured appliances—like most television and sound-system users today—in which the computer is just a part. Most software will be integrated too, and options will principally consist of programming—electronic publications and entertainments, both passive and interactive.

Obviously, the transition to this future will be gradual, and parts of it are unlikely to materialize until after the year 2000. The important point is that the extent of change will be substantial, and magazines like *MicroTimes* will reflect it. Will *MicroTimes* still be a computer magazine in another one hundred issues? Not as we know it today. At least I hope not.■

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Continued from page 148

plicated. Apple's LaserWriter (for example) was a printer that contained its own powerful computer with a large amount of memory. The LaserWriter was based on the PostScript page description language developed by Adobe Systems Inc. It would take a book to tell you all about how PostScript enables a printer to do all kinds of beautiful and precise things on paper, but for our purposes it will be enough to briefly describe how PostScript fonts work.

PostScript fonts are not sets of little pictures—they are sets of equations that describe the outline of each letter or symbol in terms of Bezier splines, a type of curve that draftsmen love because it is easy to blend one Bezier smoothly into another. Consider the lowercase letter "o". In a modern, geometrical font, this donut-shaped letter could be completely described by two concentric circles, plus the instruction to black-in the space between the circles. In a more traditional font, the circles might become eccentric ellipses, allowing for variation in the thick and thin parts of the letter. But whether you need a tiny 4-point "o" or a monster 144-point "o," it's a simple matter (for a computer) to transform the same basic equations.

Well, it's not actually that simple. Centuries ago, printers learned that small letters need to be scaled and drawn differently from large letters of the same font, to preserve a harmonious visual pattern on the page. Some features of small letters need to be exaggerated to keep them legible. PostScript fonts incorporate "hints" that tell the computer inside the printer how to do this mathematically. PostScript fonts are called "scalable" fonts because they allow letters to be printed at any size from the same basic font information.

There are many other ways to implement scalable fonts. Hewlett-Packard, for example, has its own font architecture, and the HP LaserJet includes two built-in families of scalable fonts: CG Times and Univers (additional font cartridges can be plugged into the printer).

It would be ideal if the same PostScript code that drives the printer could also be used to drive the computer's screen display. Steve Jobs' widely admired NeXT computer does exactly this, using its massive computing power to implement something called Display PostScript. But the Macintosh system architecture was already locked into its own display software, called QuickDraw. QuickDraw insists on having bitmaps to represent text characters, so when you "installed" PostScript fonts on your Mac, you had to include screen (bitmap) fonts, so the computer will have something to put on the screen when you pound the keyboard.

To help meet users' incessant demand for a screen display that would more closely match the printed output, Adobe devised a little startup program for the Mac called Adobe Type Manager (ATM) to provide a sort of simulated Display PostScript. ATM, which is also available in a version for Windows on MS-DOS computers, generates screen fonts from outline fonts "on the fly." It works pretty well.

Reluctant to have such an important part of the Mac's text display and printing capability left in the hands of Adobe Systems, Apple began several years ago to develop an entirely new scalable font architecture of its own called TrueType. TrueType fonts use a cubic splines, a slightly more complex type of curve than the Bezier splines that make up the outlines of PostScript characters. TrueType fonts generate the screen bitmaps and the printer output from the same concise data files. TrueType fonts require a lot more work from the computer, but are designed to work well on "dumb" dot matrix printers as well as "smart" PostScript printers. Perhaps for this reason, Microsoft licensed Apple's TrueType font technology for inclusion in Windows 3.1. For various technical reasons, you can't actually share TrueType fonts between a Mac and a PC running Windows, but the convergence toward a common, universal standard seems to be gathering steam.■

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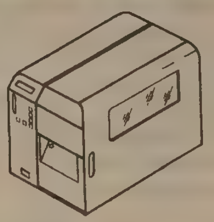

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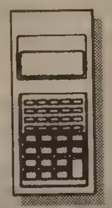

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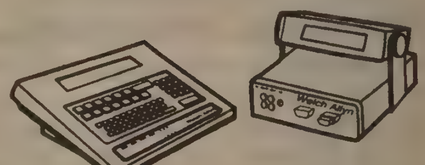

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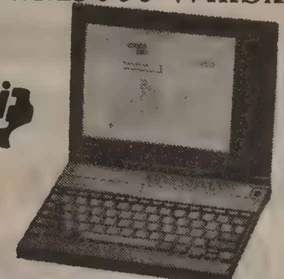

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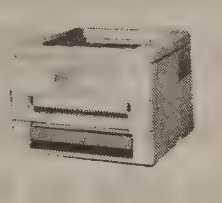

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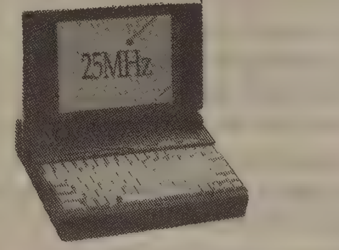

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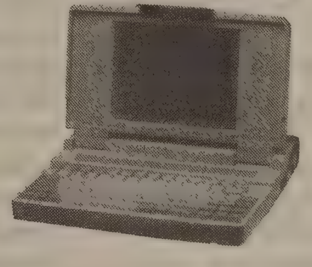

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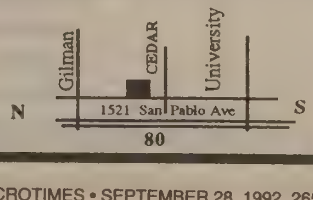

We have several billion years of evolution favoring easy movement in a three-dimensional, interactive world. We have a lot of skills all ready to go. While other computer interfaces demand that we learn new things, VR interfaces make use of the skills we already use daily.

Continued from page 176

plex objects and save them in an object library.

After you have built your world, use the command language to give the objects capabilities. They can respond to being touched or shot. They can appear or hide themselves. They can also move, to create an automated shifting maze or a pattern of "robot obstacles." They can fire at intruders.

The language is not sophisticated—variables, for instance, are numbered—but it does allow you to build a complex world. The program comes with four games that have been built using it, and you get to see what's possible with a simple graphical engine. The tutorial that accompanies the language will get you started, but be prepared for a lot of experimentation if you want to use all the commands. The package does include a short video cassette about the Studio, just to get you started.

An enterprising user can create rough simulations of real-world scenes with the Virtual Reality Studio, which the designer or a client can move through. It's easy to build a model house or street full of buildings. The Hawaii Police Department, Accolade tells us, uses the product to mock up crime scenes. The combination of relatively strong simulation and very low price won the product an "Editor's Choice" award in the May 1992 *Design Management Magazine.*

With Virtual Reality Studio you get a real taste of building three-dimensional interactive Virtual Worlds. For less than $100 you can find out if this is your calling. If so, the money was well spent—you can go on to building the Virtual Universe Interface (VUI) of the future. If not, you should take a look at a character-based family of virtual worlds.

RESOURCES:

Domark Virtual Reality Studio, $89.95
Accolade
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San Jose CA 95129
(408)985-1700

The WELL
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MUSES AND MUDS

The educational and research world is linked together by an international network of UNIX machines called the Internet. Some of the world's best minds are linked through this system. If yours isn't, it should be.

Recently Sausalito's Whole Earth 'Lectronic Link (The WELL) connected itself more fully with the Internet. It added remote file transfer protocol (ftp) and telnet. Ftp lets you move files to and from distant UNIX sites. Telnet allows you to log on to any connected system where you have an account or which accepts guests. This remarkable connection service is available to WELL subscribers (who pay $15 per month and $2 per connect-hour) for no extra charge.

There is a whole family of virtual worlds on the Internet. Called "MUDs" (Multi-User Domains) and "MUSEs" (Multi-User Simulation Environments), they are running on computers around the world. Through telnet you can log into them and become part of virtual universes that run in real time.

The exact methods for connecting are given in the WELL's Internet conference. Entry is simple and quick. After logon you find yourself in a character-based adventure game with other players who may have logged in from around the globe.

There's some similarity to the ZORK family of games that popularized character-based adventure worlds so many years ago. Each MUD or MUSE is vast network of places that are described on the screen as you move through them. In the places are entities. Some are artifacts that just sit there. Some are robots that do things. And some are your fellow citizens—the other people who have logged onto the system.

But the resemblance to ZORK is superficial. The point, in these new artificial worlds, is not just to explore them. The designers want you, the players, to interact with each other and to extend the universes you have landed in. Some users join these multiuser simulation environments to meet other people. I spent one Saturday evening conversing beside a pond with a red fox and a creature from space in the sociable Chicago-based MUD called FurryMuck. That system's purpose is simple pleasurable company.

Others join MUSEs to experiment and to build. I visited a world at MIT. Sitting in my house in San Francisco, I logged into the MIT computer as a guest and found myself in "Cyberion City," a complex universe that simulates a space station high above Earth in the twenty-fourth century.

As I was constructing my "home" in the Ada Lovelace section of the Cyberion City simulation, an android wandered by. Its owner/operator was elsewhere on the station, but through his surrogate he showed me how to build new rooms out of the raw nothingness of Virtual Space. My instructor kept his body in Cleveland, and I on the West Coast, but both of us were "really" in Cyberion City.

Character-based virtual worlds have a number of advantages. Text travels through the network at much lower cost than do graphic images. A few words will describe a scene that would take a million bits to paint. The ASCII character set is common to all platforms, so there is no translation involved. And it's a lot simpler to program a host computer to manipulate a text-based system for many guests than it is to build a shared graphic reality.

Many different systems have been put on line. A large number of them are violent adventure worlds where you will be snuffed the first few times you appear. Others are friendly, and invite you to explore without terror of virtual termination.

A few of these simulations suggest what may be the future of computing interfaces. One project at the University of North Carolina is called "Cybrary." Its creators are designing a VR front end for an information system that will connect libraries together and provide their information to online users. If you're on The WELL, you can take a look by typing "telnet rwilson.ga.unc.edu 6250". If not, imagine an information system that's like a huge library, with signs and helpful personnel, and meeting rooms. It certainly beats most of the database interfaces used online today.

Other MUSEs are the (perhaps unconscious) prototypes of the participatory novel of the future. Everything you encounter in a MUSEs is presented in text. Participatory novels will be stories in which you are a character, presented in text. You, and the other players, will be matching wits with the author, moving through the author's world, creating the story in real time. The MUSE world is still waiting for its first fine writer.

Virtual reality is an attempt to design an interface around human experience. At its best it is self-explanatory and totally absorbing. Whether you are an individual user, an artist, or a corporate system designer, you owe it to yourself to know something about Virtual Reality. To give it a try, look into the Virtual Reality Studio or the Internet's MUD/MUSE world. In the battle of interfaces that is coming before the turn of the century, VR-based systems will be "the new that is already familiar." Those who get there first will have the pleasure and profit of it. ■

California Resellers!

✦ Be a part of the MicroTimes 1992 Computer and Software Buyers' Guide

Maximize your sales and profits with the year-end issue of **MicroTimes**, on-street 12/9/92. This special issue is a year-round resource, featuring a comprehensive **Buyers' Guide and Reseller Directory** to make the most of your busiest selling season and bring you new customers in 1993. We invite you, as a reseller of computer products in California, to participate by completing and signing the attached **Reseller Poll** and mailing or faxing it to us no later than **October 1, 1992**.

✦ This Buyers' Guide Will Increase Your Sales

MicroTimes will showcase your store, your products, and your service. Here's your perfect opportunity to spotlight your store—tell your potential customers about the unique service your business offers, your in-house experts and the guidance they provide in such areas as LANs, Desktop Publishing, Systems Integrations, Accounting, and other specialties.

In addition to listing your store's name and other information alphabetically by geographical area, this year we're offering an additional feature to enable your prospective customers to find you quickly: **a separate directory of vendor-authorized sales, service, training and support providers.** So if you're authorized to provide these services for Novell, IBM, Apple, Sun, Hewlett-Packard, or other name-brand products, please give us that information so we include your name in the vendor-authorized listings.

✦ A Great Place For Your Advertising Message

The year-end issue of **MicroTimes** will bring customers into your store during your most important selling season and throughout the following year. They'll see your message next to an exciting lineup of editorial features, including our writers' picks for the best hardware and software products of 1992 and over 30 pages of Buyers' Guide announcing new products and special offers—many of which you'll already have in stock, ready to sell!

You'll also benefit from our own special promotions of this exciting issue which will appear in October and November. **MicroTimes** will help you build the consumer excitement you need to ring up sales as you ring in the New Year.

✦ Take Advantage Of This FREE Editorial Listing!

Complete the attached form and return it to **MicroTimes** before October 1, 1992. **If your store has more than one location, please use a separate form for each.**

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✦ For advertising information, call (510)934-3700 or (213)851-8600.

MicroTimes 1992
Computer and Software Buyers' Guide Reseller Poll

Mail to: Reseller Poll, 3470 Buskirk Ave., Pleasant Hill, CA 94523
Fax: (510)934-7351
Deadline: October 1, 1992

Store Name:____________________

Store Manager:____________________

Address:____________________

City:__________ State:____ ZIP:__________

Phone:__________ Fax:__________

What applications does your business specialize in, and who are your in-house experts for each specialty? (List up to three):

Specialty	Expert

What operating systems does your business support?

MS-DOS__ AmigaDOS__ Windows__ Windows NT__ UNIX (specify variety)________
OS/2__ Macintosh__ Other (specify)________

List the three top-selling brands sold at your store in 1991:

____

What special value-added services (e.g. service, training, support, warranties, return policy, etc.) does your business offer? (Please keep responses under 25 words or we will edit them to fit available space.)

____

____

____

Are you a vendor-authorized sales, service, training and/or support source?

If so, please list up to five vendors (e.g. Sun, Novell, Hewlett-Packard, Autodesk) who have authorized your business to provide these services, and check the areas for which you're authorized.

Vendor	Sales	Service	Training	Support

I certify that all the statements made in this survey are true.

Name:__________ Title:__________

Signature:__________ Date:__________

RESOURCES

Calendar Of Events

CALENDAR LISTING CHANGES

Beginning with this issue, #100, the Calendar listings are being reorganized into two sections. The first part will include conferences, shows, and other special events. The second will present classes, seminars, and workshops.

We hope this will help you to more easily find the information you are searching for as well as stay informed of the latest events and resources that are available to you.

Thank you,
MicroTimes staff

CONFERENCES, SHOWS AND OTHER SPECIAL EVENTS

OCTOBER

October 3 Computer Show & Sale. San Francisco. MarketPro. Call: (415)388-8893.

October 3 Computer Show & Sale. Santa Clara County Fairgrounds. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

October 4 Old Fashion Swap. Livermore. Computers & Ham Radio. Call: (510)447-7118.

October 5 Nanotechnology And The Future Of Computing Presentation By Eric Drexler. San Jose. Computer Literacy Bookshops. Call: (408)435-1118.

October 5–6 Multivendor And Third Party Computer Maintenance Conference. San Francisco. Frost & Sullivan. Call: (212)233-1080.

October 10 Computer Show & Sale. Cow Palace. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

October 11 Computer Show & Sale. Marin Civic Center. MarketPro. Call: (415)388-8893.

October 13–15 The Fifth Annual Technical Conference On New Microprocessors. San Francisco. Microprocessor Forum. Call: 1-800-527-0288.

October 14–18 International Computer Music Conference. San Jose. ICMA. Call: (408)924-4675. Email: icmc@sjsuvm1.bitnet

October 17 Computer Mart. Cupertino. De Anza College Special Events. Call: (408)864-8350.

October 17 Computer Show & Sale. Oakland Coliseum. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

October 17 Computer Show & Sale. Sacramento. MarketPro. Call: (415)388-8893.

October 18 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

October 18 Computer Show & Sale. Sonoma County Fairgrounds. MarketPro. Call: (415)388-8893.

October 18–20 MultiMedia Expo. Santa Clara. American Expositions. Call: (212)226-4141.

October 17–20 Ink Jet Printing Conference. San Jose. BIS Strategic Decisions. Call: 1-800-874-9980.

October 19–23 AIX Expo '92. San Jose. The Conference Group. Call: 1-800-247-0262.

October 24 Computer Show & Sale. Solano County Fairgrounds. MarketPro. Call: (415)388-8893.

October 26–27 Second Industry Symposium On Virtual Worlds Technology. University of Washington. HIT Lab in conjunction with the Washington Technology Center. Call: (206)543-5075.

October 26–28 Electronic Messaging '92 Conference: Golden Opportunities. San Francisco. Electronic Mail Assoc. Call: (708)875-8620.

October 26–30 Windows International Developers Conference. Santa Clara. Boston University. Call: (508)649-9731, ext. 248.

October 28 Semiconductor Industry Conference And 16th Annual Forecast & Award Dinner. San Jose. SIA. Call: (408)246-2711.

October 30–November 1 Third Annual Macromedia International User Conference. San Francisco. Macromedia. Call: 1-800-672-2700

NOVEMBER

November 8 Old Fashion Swap. Livermore. Computers & Ham Radio. Call: (510)447-7118.

November 16 Privacy In The Information Age Conference. Sacramento. Government Technology. Call: Deborah Furlow, (916)363-5000.

DECEMBER

December 3–5 The Open O/S Conference. San Francisco. DCI. Call: (508)470-3880.

NEW MULTIMEDIA STUDIES PROGRAM

San Francisco State University Extended Education

This Fall, SFSU Extended Education launches its MultiMedia Studies Program. Twelve courses are offered, ranging from Introduction to Interactive Multimedia, Multimedia Sound Production, Public Relations and Marketing for the Multimedia Artist and Entrepreneur, and Media Training for Teachers. Program director Professor Bob Bell has gathered instructors representing some of the industries most creative creators, including four instructors from Industrial Light & Magic. Contact: SFSU Extended Education, Downtown Center, 814 Mission St. (415)338-1205.

December 6 Old Fashion Swap. Livermore. Computers & Ham Radio. Call: (510)447-7118.

December 7–10 Sun User Group Conference & Exhibition. San Jose. The Sun User Group and Sun Microsystems. Call: 1-800-433-1790. Email: sugshow@pcinews.lonestar.org.

December 7–8 The Personal Computer Outlook Conference. San Francisco. Technological Partners. Call: (212)696-9330.

December 13 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

CLASSES, SEMINARS AND WORKSHOPS

SEPTEMBER

September 28 Advanced Microsoft Word For The Mac Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 28–30 NetWare 386 Administration Course. San Francisco. Abacus Training. Call: (415)974-7200.

September 29 Intermediate WordPerfect Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

September 30 Intermediate Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

September 30 Microsoft Excel Macros

Continued

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    IBM Vice President & President IBM Advanced Workstations Division
  - Annual Report from the POWER Board
  - Ask IBM "Open Systems" Forum
  - The Realities of Distributed Computing with the OSF DCE
- MANAGEMENT SEMINARS focusing in-depth on key issues
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  - AIX CASE
  - Installation, Customization, Service & Support for the RS/6000
  - Enterprise & Personal Computing Initiatives
- POWER *Solutions* Conference Proceedings
- Product Showcase Sessions
- Special Interest Group (SIG) Meetings
- Birds of a Feather (BOF) Activities
- Exhibitor Sponsored Events

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- Annual General Meeting
  International AIX Users Group (IAUG)
- SIG Meeting
  AIX Software Developers
- SIG Meeting
  AIX CASE Developers & Users

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MT

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The Conference Group
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800/247-0262
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☐ Rush me **POWER *Solutions* Conference** Registration information—$795 Advance Registration includes full Conference, Seminars & Exhibits plus one free /AIXtra Course (total savings of $395), if registered by October 2

☐ Rush me **/AIXtra Lecture & Laboratory Courses** information—$195 for each Lecture or Laboratory Course selecte

☐ Register me for **FREE General Sessions & Exhibits** ($25 value)—If registered by October 9, badge will be ready when you arrive. Also you may bring this coupon to on-site registration for free admittance.

Name ____________________

Title/Dept ____________________

Company ____________________

Address ____________________

City/State/Zip ____________________

Tel. (   ) __________ *Fax (   )* __________

Calendar Of Events continued

Course. San Francisco. Abacus Training. Call: (415)974-7200.

OCTOBER

October 1 Intro To Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

October 2 Intermediate WordPerfect For DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

October 2 Quattro Pro Class. San Ramon. MicroTek Education Center. Call: 1-800-282-7990.

October 5 How To Build Your Own 386 Or 486 PC Computer Class. Napa. Napa Community College. Call: (707)253-3070.

OCTOBER 17–18

CPSR 1992 ANNUAL MEETING

Stanford University

The 1992 Annual Meeting of Computer Professionals for Social Responsibility will focus on technology and citizen participation. Keynote speaker will be David Liddle of Interval, Inc. For more information call CPSR National Office, (415)322-3778. Email: cpse@csli.stanford.edu.

October 5 Programming Language J Workshop. Palo Alto. Iverson Software. Call: Joey Tuttle, (415)321-4849.

October 5–6 Intro To UNIX Workshop. San Francisco. UC Berkeley, Extension. Call: (510)323-8141.

October 6 Intermediate WordPerfect For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

October 7 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

October 7 Intro To Paradox Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

October 7–8 Intro To MS-DOS 5.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

October 7–9 Time Line 5.0: Project Management Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

October 8–9 CCI Concurrent Training Seminar. San Francisco. CCI Concurrent. Call: (415)873-6240.

October 8–9 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

October 9 Beginning WordPerfect 5.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

October 9 FileMaker Pro II Course. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

October 10 Build & Upgrade An IBM PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

October 13 Intro To DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

October 13 Intro To Windows 3.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

October 13 Intro To Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

October 14 Beginning Excel 4.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

October 14 QuarkXPress I Course. San Francisco. Media Alliance Computer Access. Call:

Continued

MarketPro Computer Shows

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Fashion Center
* Oct. 11 - SAN RAFAEL
Marin Civic Center
Oct. 17 - SACRAMENTO
Cal Expo
* Oct. 18 - SANTA ROSA
Sonoma Co. Fairgrounds
Oct. 24 - VALLEJO
Solano Co. Fairgrounds

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HP LaserJet II,IID	80	115	185
HP Laserjet IIIsi	68		175
HP Design Jet Plotter	68		175
HP LaserJet Fax,	78		
HP Deskjet 500/C/+(256K)	58		
Canon LBP-4,4+	175	225	
Canon LBP-8II/8IIR/8IIT		115	185
Canon LBP 8-III	175	245	280
Panasonic KX-4410/4430	100	135	205
Panasonic KX-4420/4450i	80	115	185
Panasonic KX-4450	115		
Panasonic KX-4455	103	138	
Okidata Okilaser 400	80	115	
Okidata Okilaser 800/820	94	129	199
Okidata Okilaser 810	145	189	
Okidata Okilaser 830/840	100	135	
IBM /Lexmark 4019/4019E	88	123	176
IBM/Lexmark 4029- 10/10L/6/5E	79	105	155
Epson EPL-6000	92	127	197
Epson EPL-4000,8000,Action II		125	195
Epson EPL-7000		112	147
Toshiba Pagelaser 6	92	127	197
TI Microlaser/PS	60		
TI Microlaser Turbo	95		238
Sharp JX-9500PS	60		
Sharp 9500PS,9500,9700	139	275	435
QMS-PS 410	100	135	205
QMS-815/825,825mr		157	227
Brother HL-4,/4V,/4VPS	102	137	207
Brother HL-8E/8D/8V	103	138	
NEC SilentWriter 2-90/290	102	137	
NEC SilentWriter 95		115	
Star Micronics -4,4III	115	155	235
Star Micronics 8	130	165	235
C-Tech CI-4/4+,8E	109		
C-Tech CI-8	119	199	
Seikosha OP104	109		
Seikosha OP 108	99	179	
Apple II NTX	59		185

COMPAQ MEMORY

		EQU. P/N	
LTE/286	1MB	117081-001	$79
	2MB	117081-002	119
LTE Lite/20,/25	4MB	129769-002	195
	8MB	129769-003	425
LTE386s/20	1MB	121125-001	69
	4MB	121125-002	195
SLT/286	1MB	110235-001	89
	4MB	110237-001	325
SLT386s/20	1MB	118303-001	95
	2MB	118304-001	145
	4MB	118305-001	219
DeskPro 386N, 386S/20	2MB	118689-001	115
	4MB	118690-001	185
	8MB	128877-001	359
DeskPr 386/20e ,/20, /25e	1MB	113131-001	89
	4MB	113132-001	209
D.P. 486/25/33L	2MB	115144-001	119
Sys./DeskPro	8MB	116561-001	359
Contura	2MB		120
	4MB		219
	6MB		495

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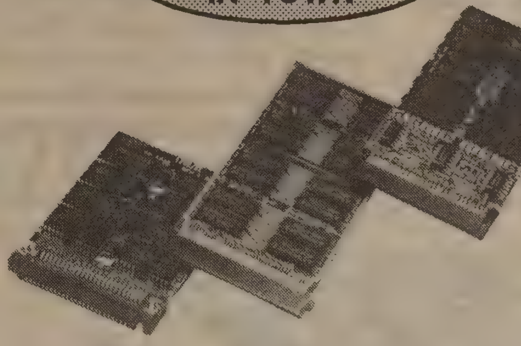

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2MB $105
4MB 175

NEC Ultra Lite
SL/20/25/25C,III
4MB $295
8MB 495

Panasonic
KX-4410/4430
2MB $135
4MB 205

Toshiba
T6400,T4400SX/SXC
4MB $299
8MB 495

Epson 4000
8000,Action II
2MB $125
4MB 195

Toshiba
T2000/SX/S/e,T2200SX
4MB $179
8MB 328

Compaq
Centura
4MB $219
6MB 495

Palmtop/Sub-Notebook SRAM

HP 95LX,,Grid Gridpad,Poqet PC,
Sharp, NCR,Grid ,DEC,IBM PC Radio
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TOSHIBA
$133

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4M X 9-70NS
TOSHIBA
$118

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Panasonic CF-170/270/370	1MB	$69
TI Travelmate 2000	1MB	95
3000	2MB	85
Sharp PC-6220	1MB	95
AST Executive Notebook	4MB	138
Everex Tempo LX	2MB	85
Tempo Carrier	2MB	145
Sanyo 18NB	2MB	85
Zeos 386sx Notebook	2MB	85
Epson NBS3	1MB	89
	4MB	219
IBM L40sx	2MB	109
	4MB	199
	8MB	359
IBM CL57SX	2MB	179
	4MB	297
	8MB	545
Packard Bell Notebook	2MB	169
	4MB	299
Altima Notebook LSX	1MB	95
	2MB	165
	4MB	275
HP 95LX,Poqet PC	512K	128
Grid Pad	1MB	198
Apple Powerbook 140/170	2MB	129
	4MB	179
	6MB	239
Mitac Notebook	4MB	279
Chaplet Notebook	4MB	279
NEC Ultra Lite SL/20/25/25C	2MB	145
	4MB	294
	8MB	495

IBM PS/2 MEMORY

		EQU. P/N	
PS/2 30	2MB	30F5360	$99
PS/2 50Z,55SX,65,70	1MB	6450603	55
	2MB	6450604	95
	4MB	34F2933	175
PS/2 70-21,A61,B21	2MB	6450608	95
PS/2 80-041	1MB	6450375	89
PS/2 80-111,121,311	2MB	6450379	109
PS/2 80-A21,A31,A61	4MB	6451060	229
PS/2 95,90,P75	2MB	6450902	115
	4MB	6450128	169
	8MB	6450129	349
PS/2 8MB EXP BRD 50,50Z,60,65SX	0MB	6450609	165
PS/2 16MB EXP BRD for all 70s & 80s	2MB	34F30XX	285
	4MB		349

TOSHIBA MEMORY

T1000 SE/XE/LE	1MB	$79
T2000/SX/S/e	2MB	105
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T3200SX	2MB	119
	4MB	199
T3300SL	2MB	128
	4MB	218
	6MB	325
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5. Price subject to change without notice.
6 We are not responsible for typographical errors 9/92

Calendar Of Events continued

(415)771-7133.

October 15 Accounting Systems Seminar: Tax And Managerial Reporting. Oakland. David Simon, CPA. Call: (510)893-5753.

October 15 Intro To Word For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

October 15–16 Novell System Supervisor 3.11 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

October 15–November 12 Desktop Publishing Comprehensive Course. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

October 16 Intermediate WordPerfect 5.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

October 16 Intro To FoxPro 2.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

October 17 How To Build Your Own 386 Or 486 PC Computer Class. Martinez. Martinez Adult School Call: (510)228-3276.

October 17 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

October 20 Beginning dBASE IV Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

October 20 WordPerfect 5.1 Class. San Ramon. MicroTek Education Center. Call: 1-800-282-7990.

October 21 Beginning Word 2.0 For Windows Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

October 21 Intro To Excel For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

October 21 Intro To Windows 3.1 Class. San Ramon. MicroTek Education Center. Call: 1-800-464-8344.

October 21 QuarkXPress II Course. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

October 22 Intermediate WordPerfect For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

October 22 Intro To Paradox Class. San Ramon. MicroTek Education Center. Call: 1-800-464-8344.

October 22 Intro WordPerfect For Windows 5.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

October 22–23 Q&A: Database/Word Processing Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

October 24 How To Build Your Own 386 Or 486 PC Computer Class. Marin. College Of Marin. Call: (510)228-3276.

October 24 & 31 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

October 24–November 7 Multimedia Exhibits For Public Spaces Class. San Francisco. SFSU. Call: (415)338-1373.

October 24–November 7 PhotoShop Intensive Course. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

October 25–29 Windows 3.1 Training Seminars And Workshops. San Jose. Descriptor Systems. Call: Joel Barnum, 1-800-528-9960. CompuServe: 70047,442.

October 26–29 Object-Oriented Analysis, Modeling, And Design Course. San Francisco. UC Berkeley Extension. Call: (510)642-4151.

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Calendar Of Events continued

tor Course. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

October 28 FileMaker Pro I Course. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

October 28 Intermediate Excel 4.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

October 29 Intermediate WordPerfect Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

October 29 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

October 30 Intermediate Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

October 30 Word For Windows Class. San Ramon. MicroTek Education Center. Call: 1-800-282-7990.

October 31 How To Build Your Own 386 Or 486 PC Computer Class. San Francisco. SF State University. Call: (415)338-1205.

NOVEMBER

November 2–3 How To Measure Customer Satisfaction Seminar. San Francisco. UC Berkeley Extension. Call: (510)642-6117.

November 3 DOS 5.0 Class. San Ramon. MicroTek Education Center. Call: 1-800-282-7990.

November 3 Intro To Excel 4.0 Class. San Ramon. MicroTek Education Center. Call: 1-800-464-8344.

November 3 Quark XPress I Course. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

November 4 FileMaker Pro II Course. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

November 4–5 Advanced Troubleshooting For The Macintosh Seminar. San Francisco. Data-Tech Institute. Call: (201)478-5400.

November 5 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

November 5 Lotus 1-2-3 3.1 Class. San Ramon. MicroTek Education Center. Call: 1-800-282-7990.

November 7 Build & Upgrade An IBM PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

November 10 Intro To Lotus 1-2-3 For Windows Class. San Ramon. MicroTek Education Center. Call: 1-800-464-8344.

November 10 Quark XPress II Course. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

November 11–13 Time Line 5.0: Project Management Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

November 12 Adobe Illustrator I Course. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

November 12–13 Novell System Supervisor 3.11 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

November 12–13 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

November 14 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

November 16–17 Project Planning Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

November 17 Intro To Ami Pro Class. San Ramon. MicroTek Education Center. Call: 1-800-464-8344.

November 18 Intermediate Excel 4.0 Class. San Ramon. MicroTek Education Center. Call: 1-800-464-8344.

November 19 Accounting Systems Seminar: Tax And Managerial Reporting. Oakland. David Simon, CPA. Call: (510)893-5753.

November 19 Adobe Illustrator II Course. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

November 19–20 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

November 21 Advanced Quark Course. San Francisco. Media Alliance Computer Access. Call: (415)771-7133.

November 23–24 Q&A: Database/Word Processing Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

November 24 Windows 3.1 Class. San Ramon. MicroTek Education Center. Call: 1-800-282-7990.

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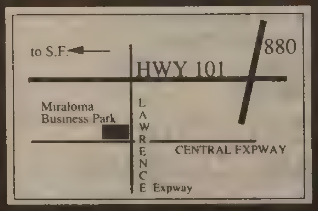

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42	ELS42S	SCSI	•NEW•	$199
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130	IDE 7120AT	3.5"x1"	15ms	$Call
130	SCSI 7120SR	3.5"x1"	15ms	$329
213	**IDE 7213A**	3.5"X1"	**NEW**	**$409**
340	**IDE LXT340A**	**3.5"**	**15ms**	**$689**
340	SCSI LXT340SY	3.5"	15ms	$739
535	**SCSI or IDE**	**3.5"**	**12ms**	**$999**
670	**SCSI XT8760**	**FH**	**16ms**	**$1199**
1.2Gb	**Panther SCSI**	**FH**	**13ms**	**$1575**
1.7Gb	**Panther SCSI**	**FH**	**13ms**	**$1869**

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42	IDE CP3000	3.5"X1"	FAST	$169
84	IDE CP30084	3.5"X"1	17ms	$239
120	IDE CP30104	3.5"X1"	19ms	$299
170	**IDE CP30174E**	**3.5"X1"**	**17ms**	**$349**
213	IDE CP30204F	3.5"	16ms	$439
544	IDE CP3544	3.5"	12ms	$999
540	SCSI-2 CP3540	3.5"	12ms	$999

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340	SCSI MC1684	HH	14ms	$1099
340	ESDI MC1664	HH	14ms	$999
670	SCSI MC1624	HH	14ms	$1279
1.2Gb	**SCSI-2 MC1598**	**FH**	**14ms**	**$1749**
1.5Gb	**SCSI MC1528**	**FH**	**14ms**	**$1839**
1.6Gb	SCSI-2 MC1908	FH	11ms	$2199
2.0Gb	**SCSI-2 MC1548**	**FH**	**14ms**	**$2399**

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SIZE(MB)	TYPE/MODEL	Size	SPEED	PRICE
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130	IDE/ST3144A	3.5"	17ms	$299
140	IDE/ST3162A	3.5"	17ms	$Call
670	**ST4766N**	**5.25**	**Fast**	**$1249**
670	Wren Runner II	5.25"	11ms	$1449
1.2Gb	Wren 7 SCSI	5.25"	14ms	$1649
1.6Gb	Elite fast SCSI	5.25"	Fast	$2099
2.4Gb	Elite II fast SCSI	5.25"	Fast	$3499

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1.2GB	**C2247**	**3.5"**	**12ms**	**$2049**
670Mb	**SCSI**	**5.25"**		**$Call**
1.2GB	C97558	5.25"	13ms	$1879
1.6GB	C97560	5.25"	13ms	$2349
2.3GB	C3010	5.25"	11ms	$3599

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2 Yr. Factory Warr.

84	IDE WDAC280	3.5"X1"	17ms	$229
122	IDE WDAC2120	3.5"x1"	17ms	$299
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122	Quantum ELS122S	2	NEW	$469
125	Maxtor 7120SR	1	15ms	$395
127	Quantum ELS127S	2	NEW	$429
170	Quantum ELS170S	2	NEW	$499
213	Maxtor 7213Sy	1	15ms	$Call
240	Quantum LPS240	2	Fast	$749
340	Maxtor LXT340SY	1	15ms	$919
425	Quantum 425S	2	9ms	$999
425	**Fujitsu M2623**	**5**	**12ms**	**$1059**
520	**Fujitsu M2624FA**	**5**	**9ms**	**$CALL**
670	Fujitsu M2263SA	5	16ms	$1469
670	Maxtor XT8760S	1	16ms	$1299
670	Micropolis MC1624	5	13ms	$1399
1.2	**Hewlett Parkard**	**5**	**12ms**	**$2149**
1.2Gb	**Maxtor Panther**	**2**	**13ms**	**$1789**
1.2Gb	**Fujitsu M2266SA**	**5**	**14ms**	**$1889**
1.2Gb	**Seagate ST41200**	**1**	**15ms**	**$1869**
1.2Gb	**Micropolis MC1598**	**5**	**14ms**	**$1999**
1.5Gb	Micropolis MC1528	5	14ms	$2199
1.7Gb	**Maxtor Panther**	**2**	**13ms**	**$1999**
2.0Gb	Fujitsu M2652SA	5	11ms	$3099
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BULLETIN BOARDS

RESOURCE LISTING CHANGES

As electronic bulletin boards continue growing, system operators are adding phone line that include additional area codes. With this issue (#100) *MicroTimes* introduces a "Multi-Zone" category for BBSes with access phone numbers in multiple area codes.

Thank you,
MicroTimes staff

209

BerthaBoard. (209)823-0093. 1200–14,400 V.32. Three lines, 4.5GB, 65,000 files, lrg. msg. base. [Exp. #102.]

408

A32 Macintosh User Group BBS. (408)263-0299. 24 hrs., 2400. Second sight, members only. Voice: (408)263-0398. [Exp. #100.]

Amateur Action BBS. (408)263-3393. 8-N-1, 1200/2400/9600. 100% Adult Amateur GIF files, eight lines. [Exp. #102.]

Amiga (The Dungeon) BBS. (408)384-6370. 24 hrs., 1200/2400. Games, files, info on Amiga viruses, some IBM files. Sysop: Garnett Sanders. [Exp. #100.]

Apple Byte GS. (408)578-3201. 24 hrs., 1200/2400/9600/14,400. Apple II Support BBS, member FVNet, running Metal BBS software, 685MB. Free. Sysop: Jim Buchanan. [Exp. #101.]

Atlantis BBS. (408)495-2729. 8-N-1, 1200/2400. Catering to the bisexual and homosexual communities of Santa Cruz. Sysop: Raistlin Majere. [Exp. #100.]

Bare Bones BBS. (408)272-2173. 8-N-1, 24 hrs., 9600. Two lines, Mac file transfers. Free, instant validation. Sysop: L'il John. [Exp. #101.]

Bay Area Atari User Group (BAAUG) BBS. (408)986-0215. 8-N-1, 24 hrs., 300/1200/2400. [Exp. #101.]

The Beggar's Tomb. (408)243-TOMB. GIFs, stories, and animation for adult orientations. Sysop: The Grim Reaper. [Exp. #102.]

Berryessa Central. (408)946-5642. 8-N-1, 1200/2400/9600/14,400. All computers, interesting message sections. Sysop: Mark Shapiro. [Exp. #100.]

Blue Smoke BBS. (408)265-4600, (408)269-4127. Adult files, SIGs. Free telex with membership. Sysop: Timber Wolf. [Exp. #102.]

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Burn This Flag. (408)363-9766. 9600. Topics from Abortion to Zionism. NIRVANAnet. No fee. [Exp. #102.]

Code Room. (408)266-3818. 8-N-1. A Programmer's BBS. Tons of C files. Win & OS/2 prog. conf. FidoNet 1:143/326. Sysop: Ramin Akhbari. [Exp. #101.]

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Cruz'in BBS. (408)464-8924. 300/1200. Commodore 64/128. Online games, file transfers, message base, and user group. Sysop: Michael Baldwin. [Exp. #100.]

Cruzio. (408)423-9995. 8-N-1, 1200/2400/9600. Santa Cruz county email, USENET and scruz newsgroups, databases, files, MUD/chat. Sysop: Peggy Dolgenos. [Exp. #102.]

Crystal Caravan BBS. (408)263-0782. 8-N-1, 1200/2400/9600/14,400. Online games, PC files, Amiga .MOD files, etc. Free. Sysop: Dynax. [Exp. #102.]

The Dark Side. (408)245-SPAM. 24 hrs. Free access to Usenet and UUCP mail. Since 1985. Internet: darkside.com. [Exp. #100.]

Dating Tree BBS. (408)946-1431. 16 lines, online chat, email, matchmaking, and more. Since 1988. Sysop: Ima Gnome. [Exp. #102.]

DC-To-Light. (408)262-5150. 8-N-1, 24 hrs., 300/1200/2400/9600. MS-DOS, CAD, UNIX, WIN, LAN & HAM: Conferences and email. Sysop: Fred Townsend. [Exp. #100.]

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The Electric Pages. (408)253-4280. 300/1200/2400. Commercial and private advertising. Select by category or key words. Voice: (408)253-1709. Sysop: Contemporary Communications, Inc. [Exp. #100.]

The Enclave. (408)338-9754. 8-N-1, 300/1200/2400. Writers' BBS, etc. Local forums, Usenet news, UUCP mail. Free. Sysop: Raven. [Exp. #102.]

Escape To Other Worlds BBS. (408)956-1750. 8-N-1, 1200/2400/9600/14,400. SF/fantasy, comics, games, msgs. Three lines, D/L files. Mac and PC GIFs. [Exp. #102.]

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Infoserve Connections. (408)243-2102. 8-N-1, 24 hrs., 2400. UUCP/Usenet/email for DOS, Mac, and 386/UNIX. Sysop: B. Oesterreich. [Exp. #102.]

The I/O Temple. (408)427-3453. 8-N-1, 1200–14,400. Msg bases, online games, and more. FidoNet 1:216/513. Sysop: Armand. [Exp. #101.]

Lynn-Western Newswires. (408)778-5994 & 778-9656. 8-N-1, 24 hrs., 1200/2400. FidoNet 1:143/304. Professional information on technology, management, and worldwide investment news. Stock Market data online. [Exp. #100.]

Magic Kingdom BBS. (408)245-3961, 253-2426. 16 lines, teleconference, multiplayer games, SIGs, files, and more. [Exp. #102.]

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Mongoose BBS. (408)733-3034. 24 hrs., 1200–38,400. We're back, better than ever! Over 2GB of space and files. Free access. Sysop: Robert Yag. [Exp. #101.]

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BAY AREA BBSes

By Kathleen Creighton

In Case Of Disaster, Check Your BBS

October marks the third anniversary of the Loma Prieta earthquake, an event which had as its byproduct a mini-boom in publicity for the United States Geological Service (USGS) and a renewed attention to earth sciences and disaster preparedness among professionals, hobbyists, and at-risk residents.

Because of the broad spectrum of interest in earthquakes and other natural disasters, this column includes many different types of electronic resources, local and long-distance.

Usenet

Some Usenet readers in California make a beeline to the newsgroup "ca.earthquakes" when the earth moves, for up-to-the-minute information provided by USGS volunteers, and anecdotal information and observation from Californians on the scene. When things are relatively quiet, discussions on ca.earthquakes include a wide range of topics, from earthquake preparedness to "prediction," building construction, detailed analysis of earthquake science, and topics in between. In addition, the USGS volunteers post a summary of California earthquake activity and PostScript maps on a regular basis.

Public Seismic Network

USGS volunteers also staff the Menlo Park node of the Public Seismic Network, a four-node BBS network (Menlo Park, San Jose, Pasadena and Memphis, TN) available to the public (with the caveat that the information on PSN may not reflect the official views of the USGS). These BBSes host message areas and provide downloads of seismic event files, DOS and Macintosh viewing software, California earthquake activity summaries and GIF files, and earthquake preparedness information. (Menlo Park node 415/327-1517, 8N1, 2400 baud; San Jose node 408/226-0675, 8N1, 2400 baud, Steve Hammond, sysop).

CDMG ONLINE

Straying a bit out of the Bay Area to State of California offices in Sacramento, the California Division of Mines and Geology offers a comprehensive earth science BBS (CDMG ONLINE), an experimental service of the State of California Department of Conservation, open to the public. (916/327-1208, 8N1, 2400 baud, Ted Smith and Steve Newton-Reed, sysops.)

The primary objective of CDMG, which functions as California's equivalent to the USGS, is to provide useful information on California geology, mineral resources and seismology to the public in the form of publications (there's a complete list of available publications and maps online, as well as subscription information for *California Geology*), and also gives specific advice in response to individual inquiries (which should not be made online—call the CDMG voice information number at 916/445- 5716).

CDMG ONLINE is an adjunct to CDMG's voice information, carrying lists of State of California jobs available for geoscientists, upcoming conferences, etc. But it also carries several message areas, including ca.earthquakes and the sci.geo groups from Usenet, and several ROCKnet echos. ROCKnet is a joint venture network of CDMG, GISnet in Colorado, Geoapplications Precambrian in Arizona, and GEOnet in Kansas (owned and operated by the Kansas Geological Survey). It's a long-distance call from the Bay

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BBSes

Mountain Retreat. (408)335-4595. 1200–14,400. 660MB, FidoNet member, specialty Turbo Pascal. Sysop: John Jamieson. [Exp. #101.]

The Mud Hole BBS. (408)739-8297. Messages, great door games, win extra time in weekly tournaments. [Exp. #102.]

Nitelog BBS. (408)655-1096. 24 hrs., 300–16,800. Files, adult, 11 lines, 4.9GB. Sysop: Karl Van Lear. [Exp. #101.]

Online Apartment Rentals. (408)245-6915. 1200. Free service for locating an apartment. [Exp. #100.]

Pacific Exchange BBS. (408)946-8561. 12 lines and over 40,000 IBM files. Since 1986. [Exp. #101.]

PIE BBS Loves High Speed! (408)733-4670. 8-N-1, 300/1200/2400/9600/14,400. Three lines, Macintosh, Apple II & GS, MS-DOS/Windows. Sysop: Clay Walker. [Exp. #102.]

Ring Of Fire BBS. (408)739-8753 (2400), 739-8371 (9600). BBS for United Sysop's Association and Silicon Valley Novell Users Group. Since 1983. Sysop: Bill Strouse. [Exp. #101.]

The Rising Storm. (408)739-8693. 8-N-1, 9600. Emergency prep., firearms, current events, earthquake maps. Sysop: Kirk DeHaan. [Exp. #100.]

The Savage Garden. (408)423-3812. 8-N-1, 1200/2400/9600. Specializing in alternative realities and subject matter concerning the unknown and unusual. [Exp. #100.]

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Shareware Connection BBS. (408)261-3278, 261-2821. 1GB+ adult files, 1GB+ IBM files. PC-SIG/PC-PIX CD-ROM, shareware magazine. [Exp. #101.]

The Shrine BBS. (408)747-0778. Magic, religions, and sex. Adult and women's only areas by request. All lifestyles welcome. Sysop: Tom Joseph and Junell Zzz. [Exp. #102.]

ShrinkTank BBS. (408)257-8131. 8-N-1, 300/1200/2400 & 9600 for SuperModem users. Mental Health, Psychology, Men's Issues, Metrolink conferences. All users welcome! Sysop: Rob Bischoff, Ph.D. [Exp. #100.]

The Silicon Connection. (408)492-9700. 24 hrs., 300/1200/2400. Electronic PenPal Network, 16 lines. [Exp. #100.]

Silicone Valey BBS. (408)946-3792. 8-N-1, 24 hrs., 1200/2400. Mac/IBM graphics, games, utilities. G–XXX. No fees. Sysop: Alan Ginsburg. [Exp. #101.]

Skies The Limit BBS. (408)254-1192. 1200/2400/9600. Files for everyone. Membership and non-membership areas. [Exp. #100.]

SUBBS. (408)765-1695. 300–9600 V.32. Free, public, upload, download, Intel sponsored. Sysop: Mark Elston. [Exp. #100.]

Success BBS. (408)267-8325. 8-N-1, 1200/2400. S. Bay Entrepreneurs Assoc. BBS. Business opportunities, job shop, buy/sell, ads, personals. Networking for success. Free. [Exp. #100.]

SVCS BBS. (408)956-1204. 8-N-1, 24 hrs., 300/1200/2400/9600. Features MS-DOS, CAD, UNIX, GIF, WIN, LAN, & HAM. SIG conferences and email. Sysop: Fred Townsend. [Exp. #100.]

The Support Network BBS. (408)259-0297. 8-N-1, 2–8 pm, 1200/2400/9600. Community computing for Santa Clara County. Sysop: Frank Arnold. [Exp. #102.]

T24-Hours-A-Day BBS. (408)448-1126. 24 hrs., 300/1200/2400. Theme: 12 Step Programs. Sysop: Mike R. [Exp. #100.]

TeleGraphics. (408)737-8720, 737-1703. DTP, graphic art, multimedia, general interest, Mac based. Free. [Exp. #102.]

Texas Instruments PCs. (408)296-2503. 24 hrs., 2400. Message base, user group info & software for TIPC. Sysop: Mark Cantrell. [Exp. #102.]

Thunder Mountain BBS. (408)266-4553. 8-N-1, 300/1200/2400. Two lines, chat, files for all, email, matchmaker—all free. Sysop: Sysflyer. [Exp. #102.]

The Village. (408)229-0706. 300/1200/2400/9600/14,400, USR-HST V.42bis. Online games, 400MB. Full access with first call. Sysop: Michael Wilson. [Exp. #101.]

415

4 Corners BBS. (415)989-0211. 24 hrs., 300–14,400. Online games, 5000+ files, msgs. Free access, low rates. Sysop: Stephen Kortz. [Exp. #100.]

38 North, 122 West. (415)343-7517. 8-N-1, 9600. Free boat-for-sale ads, psychotherapy, diplomacy game, interracial couples. Fido coming soon. [Exp. #101.]

ABACUS (Atari Bay Area Users Society). (415)587-8062. 300/1200/2400. For 8-bit and ST/TT users. [Exp. #100.]

ALIEN BBS. (415)359-8774. 8-N-1, 24 hrs., 1200–14,400. Amiga/IBM/Mac info. Adult boards w/registration. Free. Sysop: Ed Vandehey. [Exp. #100.]

Anatomically Correct BBS. (415)856-8425. 24 hrs., 2400. Free, adults only, unique "chat," dozens of articles & message base. Sysop: Howeird. [Exp. #101.]

Art/Online. (415)255-7045. 8-N-1, 1200/2400/9600. Fine Art Forum, local and international email. Sysop: Jim Raridan. [Exp. #100.]

Asian Exclusive Act. (415)338-7592. 24 hrs., 300/1200/2400, 9600 (Hayes only). Intelligent discussion of Asian American issues and events. All welcome, validation req'd. Sysop: Chin Ming Hornbuckle. [Exp. #100.]

Back Door For Bi/Straight Men & Women. (415)756-8452. 8-N-1, 24 hrs. 10 lines, 18 and over only. [Exp. #101.]

Back Door For Gay/Bi Men. (415)756-6238. 8-N-1, 24 hrs. 33 lines, alt lifestyles, 18 and over only. [Exp. #101.]

Back Door For Lesbian/Bi Women. (415)756-6426. 8-N-1, 24 hrs. 10 lines, alt lifestyles, 18 and over only. [Exp. #101.]

BAHUG BBS. (415)326-4486. 8-N-1, 24 hrs., 300/1200/2400.

Continued

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Area, but if you like to discuss geoscience, CDMG ONLINE is the place.

The USGS Branch Of Global Seismology And Geomagnetism Online Information System

This is an information-only BBS offering earthquake lists frequently requested by people calling the National Earthquake Information Center in Golden, Colorado, such as significant earthquakes of the world (by year); significant earthquakes of the United States (January 1986-June 1989); most destructive earthquakes in the world, earthquakes with 1,000 or more deaths in the world (from 1900); the ten largest earthquakes in the United States; earthquake facts and statistics; and number of earthquakes per year, magnitude 7 or greater (1900-1989). The quick epicenter determination program gives several search options for locating specific seismic events. (800/358-2663, 7E1, 1200 baud.)

Also Of Interest

Rising Storm BBS

Rising Storm BBS provides a forum for information exchange between those individuals interested mainly in emergency preparation and survival. It includes message areas in self-sufficiency and self-defense, and Fidonet law and order, firearms and civil liberties echos. Rising Storm BBS is also the only California node of Survnet, a small survivalist network, which includes survival and survival politics message areas. This BBS does not promote survivalist orthodoxy per se, and participants with an interest in the subject matter but of different points of view are welcome. (408/739-8693, 8N1, 2400 baud, Kirk DeHann, sysop.)

QU-AN-TO BBS

QU-AN-TO BBS is for people who make serious use of quantitative analytic tools (IBM) in many diverse fields of human endeavor, especially people interested in areas such as mathematics, statistics, engineering, and physical sciences (such as astronomy, electronics, and geology). While the sysop thinks that mathematics is probably the BBS's strongest area, some of the downloads available in the science section (including a few seismic downloads) will likely interest a number of physical science hobbyists. (415/255-2981, 8N1, 2400 baud, Ken Hunter, sysop.)

Disaster Research Bulletin

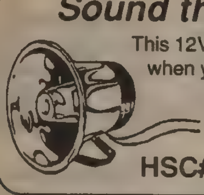
Disaster Research is an electronic bulletin available through the Internet (email hazards@vaxf.colorado.edu) for creators and users of hazards research information. Queries, conversations, and contributions are encouraged. A recent issue broached the problem of lack of central clearinghouse for volunteers in the aftermath of Hurricane Andrew.

For those without Internet accounts, the current and back issues of Disaster Research are archived on the State and Local Emergency Management Data Users Group (SALEMDUG) BBS in Virginia. SALEMDUG is an association of State, local, and FEMA emergency management personnel who share an interest in fostering the use of computers to support emergency management programs and activities. One of its goals is to facilitate the application of computer technology to emergency management problems and the transfer of automated data processing information among all levels of government. SALEMDUG message bases on this board are open to members only, although the download area is available to the public. (202/646-2887, 8N1, 2400 baud, Rod Renner and Chip Hines, sysops.)

Inquiries about Disaster Research can also be directed to David Butler, Natural Hazards Research and Applications Information Center, Institute of Behavioral Science #6, Campus Box 482, University of Colorado, Boulder, Colorado 80309-0482. Telephone: (303)492-6818 Fax: (303)492-2151.

HSC's Autumn Attractions ...
...the savings are falling your way!

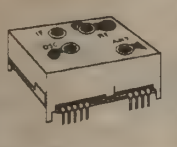
Sound the Alarm! Sirens for Sale!



This 12VDC yelping siren is just what you need for those times when you want to attract a lot of attention! These babies are LOUD! Genuine UNGO siren, new in box. Sorry, no other alarm circuitry available, but our techie customers should have no trouble coming up with their own!

HSC# 13619 $9.95 ea. or 10/$75.00

Teeny Tiny Tuner Modules



Here is a little module that you won't find anywhere else! This tiny (only 1" x 1.75" x .5") PC mount package is a varactor tuned FM tuner! Made by Toko (Model #TMC103A) for use on an IBM PC FM Subcarrier adaptor board. Uses 8 - 12VDC, tunes from 88.3 to 108.1 MHz from 75 ohm antenna input, has 10.7 MHz IF output with VCO output for control feedback to tuning circuitry. We provide a schematic of a suggested application showing pinout of this module with related tuning circuit.

HSC #13101 $4.95 ea. or 10/$39.95

Makes Flashlights obsolete!!!

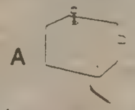
Enjoy hands-free portable lighting with the WORK LIGHT. It's lightweight. It's practical. Can be used with glasses. One year mfr. warranty. Batteries included (but may be old).

Reg Retail Price $7.95

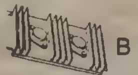
HSC# 13354 $3.95

More from HSC's Project Locker...

We've scoured our shelves once again for rare & unusual parts that will get you thinking of the many uses to which they may be put. Many items you just won't find anywhere else, and our prices will encourage you to dream up new projects!

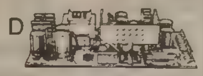


A. Inexpensive Motion Detector consists of a sealed metal box with a spring-mounted weight that closes a contact when jostled. Sensitivity adjustment & two mounting ears complete the package. 2.5" x 2" x 1" HSC# 11456 $.95 ea.



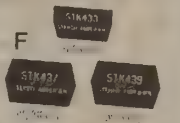
B. Heatsink with complementary Darlington Pair transistors measures 3" x 6.25" x 1", has 2N6031 (NPN) and 2N6058 (PNP) already mounted. 80V, 12A, hFE = 750 to 18000 @ 6A. HSC#9677 $5.95

C. Microswitch 103SR11A-1Proximity Sensor -- Hall-effect detector operates on 5 VDC 4 mA, sources 3.5 VDC max 20mA in presence of greater than 25 Gauss magnetic field. .43" dia. x 1" (nuts not included) With spec. sheet. HSC #5319 $.99



D. Tiny switching power supply, perfect for powering a single 3.5" hard disk drive. 2" x 6.25" x 1.25". Made by Skynet, used, tested good. Selectable 110/220VAC input, 5VDC @ 2A and 12VDC @ 1.5A output. HSC #12758 $17.50

E. Nine-digit, eight decimal point numeric LCD with solderable connection strip. No funny sockets needed! .5" high digits, overall size of display .75" x 3". Pinout included. HSC #13518 $1.95 ea. or 10/$15.00



F. Stereo Amplifier Modules -- popularly used in many hi-fi applications. Pinout and suggested circuit diagram included. Three to choose from!

HSC# 12206	STK-433	7 Watts/ Ch.	$3.95
HSC# 12123	STK-437	10 Watts/ Ch.	$6.95
HSC# 12124	STK-439	15 Watts/ Ch.	$6.95

G. Astec UM1285A 2/3 Video Modulator -- input baseband video, get channel 2 or 3 RF out. 1.75" x 3" x .75" HSC# 5623 $2.95

H. Touch Element from Koala Pad -- translate finger position to X-Y coordinates, or replace the element in your Koala pad that was damaged by your child scribbling on it with a ball-point pen! HSC# 13005 $.95 or 10/$7.50

They're back! The Electronic "Leash" and Static "Watchdog"

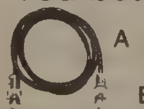
HSC is once again able to offer you two alarms that protect you in unusual ways...The first is the "Sensor Alert" seen at left. This is a pair of small units that are "tuned" to each other and like to be near one another! When separated by more than 15 to 30 feet, the receiver emits a beeping tone. Think of the uses! Put the transmitter on your small toddler at the shopping center, keep the receiver on your belt (both units have clips). If Junior wanders off...BEEP! Or put one on your car keys, you will never leave the room without them! The possibilities are endless. The receiver is only 2" x 2.75" x .5", and the transmitter is even smaller, only 1.5" x 2.25". Each unit uses three button cells (included). HSC #13024 only $6.95 for the set. The other alarm is our Static Charge Alarm, seen at right, which will alert you to the presence of static electricity fields in its vicinity. This is important to know when working with CMOS or other sensitive integrated circuits. The unit will beep when one of three selectable levels of static charge is detected, allowing you to take preventive action. Only 4" tall, uses a 9VDC 300mA adaptor (included) or a 9V battery (not included). Prevent shocking developments! HSC #12846 only $4.95

MOSFET Madness - Mix & Match!

MOSFET's:

Part #	Case	Pol.	Volts	Watts	Amps	On-Res.	HSC#	Price
BUZ42	TO-220	N-Ch	500V	75W	4A	2Ω	11323	$1.35
BUZ45	TO-3	N-Ch	500V	125W	9.6A	.55Ω	10798	$4.50
BUZ74	TO-220	N-Ch	500V	40W	2A	3Ω	11324	$ .95
IRF122	TO-3	N-Ch	100V	40W	7A	.4Ω	9837	$2.50
IRF441	TO-3	N-Ch	450V	125W	8A	.85Ω	11293	$4.50
IRF512	TO-220	N-Ch	100V	20W	3.5A	.8Ω	11296	$ .75
IRF611	TO-220	N-Ch	150V	20W	2.5A	1.5Ω	11326	$ .75
MTM6N60	TO-3	N-Ch	600V	150W	6A	1.2Ω	11576	$7.50

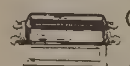
Do we have connections? You bet!



A. Coaxial Cables -- Ready made for your immediate use!

HSC# 12536	6 ft. 75 Ω, TNC Male to Male	$1.29
HSC# 13102	3 ft. 75 Ω, "F" Male to Male	$ .95
HSC# CA903B	6 ft. 75 Ω, BNC Male to Male	$3.95

B. Pomona 1809-0 Tip-jack to Banana Plug adapter -- Don't throw away those favorite test leads! Just get this genuine Pomona adaptor at over 60% off! HSC# 13014 $.50 ea. or 10/$4.50



C. SCSI Terminator -- single ended with Amphenol 50-pin molded connector. HSC # 11397 $4.95

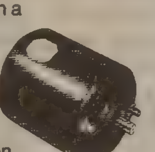
D. D25S to D25S Gender Changer. Make a male cable connector into a female! HSC# 12497 $1.49

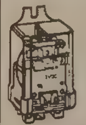
E. Cigarette Lighter Plug with 3 ft. black zip cord HSC# 13028 $.95

F. Dual Audio Patch cable with RCA connectors HSC#13359 $.79

Attention: Robot Builders & Hobbyists!

A. Just in! 12VDC two-speed reversible motors, perfect for your own personal R2-D2's locomotion! These motors are 3" dia. x 4.5" long with a .5" long shaft. They will provide up to 30 oz.-in. of torque at 2700 RPM, unloaded speed is closer to 5000 RPM. Depending on load they draw anywhere from 5 to 9 amps. The .31" (5/16") dia. shaft is cut with gear teeth, but you could still put a pulley or gear with a set-screw on it. Generous 33" long leads are color-coded for easy hook-up. Connection diagram and torque curve chart provided. These motors are new, but slightly dusty. **HSC# 13617 $7.95 ea.**





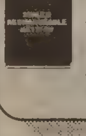
B. 12VDC SPDT Relay -- just the thing for controlling the above motor (in fact, they are both left-overs from a camper-jack system). C.P. Clare GP3R211ND1000 relay is rated at 10 amps, uses solderless quick-connect tabs, and has handy mounting ears. **HSC# 13618 $4.95 ea.**

C. Heavy duty Coil-cords -- Two types available. Makes connections to moving fixtures easy! Rugged SJO insulation, slightly dusty. These are not easy to find, and only limited quantities are available!

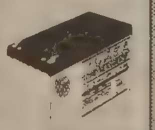
HSC# 13620 20AWG, 5 cond., 5' stretches to 24' $5.95
HSC# 13621 18AWG, 4 cond., 4' stretches to 25' $7.95

Popular Rechargeables, Popular Prices!

Gates
Energy Products



These sealed rechargeable lead-acid cells and batteries are always in demand at HSC, so don't wait to order if you want some! The Gates cells were removed from multi-cell packs, so the tabs have been soldered, but they have plenty of life! We even learned that you can "rejuvenate" a flat cell by removing the outer metal sleeve and popping out the rubber plug at the top. Just add some distilled water like a car battery! Some of the 24 VDC multi-cell packs are also available. The Yuasa NP7-12 Batteries seen at right are new out of the crate. They use a gelled electrolyte, so don't try "rejuvenating" these!



Type	Size	Rating	Wt.	HSC#	Each	Pack/12
D Cell	2.65" x 1.33"	2V @ 2.5Ah	.4 lb	12327	$2.50	N/A
X Cell	3.16" x 1.73"	2V @ 5Ah	.8 lb	13513	$3.50	$40.00
J Cell	5.34" x 2.03"	2V @ 12Ah	1.8 lb	13512	$5.50	$60.00
NP7-12	2.5" x 4" x 6"	12V @ 7Ah	6 lb.	13123	$14.95	N/A

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Terms: Some quantities limited; all items subject to prior sale. **Minimum order: $10.00 plus shipping.** Orders under $20.00 subject to $2.00 handling fee, in addition to shipping. All orders shipped FOB Santa Clara, CA (this means you pay freight!) by UPS Surface (no P.O. Boxes) unless otherwise specified, in which case prevailing carrier rate plus $5.00 handling fee applies. Prepaid orders that don't include shipping charges will be shipped freight COD. There is a $4.00 UPS charge added to shipping charges for COD shipments. If you have questions about your order, please call Customer Service at (408) 732-1854 M-F 9AM to 5PM PST.

DTP info and help for Heath/Zenith machines. Free. Co-Sysops: Freeman Bradford and Ed Hayes. [Exp. #100.]

Bay City Reader Online. (415)552-3961. 2400. SF's online magazine—politics to poetry. $25 subscription. [Exp. #102.]

BBS Of San Francisco Apple Core. (415)563-8652. 24 hrs., 2400. Lots of fun, supports Apple II and GS computers. [Exp. #102.]

The Boundary Line BBS. (415)398-6171. 8-N-1, 24 hrs., 1200/2400/9600/14,400. Attorney sysop. For the real estate professional. Local conference only. Free. Sysop: William Mayo. [Exp. #100.]

California ConneXion Partyline. (415)927-2739. 8-N-1, 23.5 hrs., 300/1200/2400/9600/14,400. Nine lines, 400MB, group-chat, worldwide network, 40+ pubs, matchmaking, adults only. Reg required. [Exp. #102.]

California Online! (415)898-2565. 14,400. Five lines, chat, echo-mail, adult areas, Windows. Free, registered access. Sysop: Jim Thornson. [Exp. #101.]

Charisma. (415)349-6576. 1200–14,400. Full reg. First call, four nodes, thousands of useful files. All ILink, SmartNet & Intelac conferences. Sysop: Tom Swegles. [Exp. #102.]

The Classifieds BBS. (415)665-7918, 665-2475. 8-N-1, 24 hrs., 1200/2400/9600/14,400. For sale, echomail, files, and more. [Exp. #102.]

Clinton For President. (415)641-4465. 8-N-1, 300/1200/2400. SF Clinton Committee: How the Clinton Presidency will change America, campaign info. [Exp. #100.]

ComPUCall. (415)703-1297. 7-E-1, 1200/2400. California's Public Utilities Commission's calendars, decisions, releases. [Exp. #100.]

Computer Show Hotline. (415)340-9370. 8-N-1, 1200/2400. Latest Computer Show info. Complete list of dates, times, locations, and directions. [Exp. #101.]

Crystal Palace BBS. (415)564-5623. Echomail, online games, TW2002/SRE/GW, IBM shareware files. Fido, RBBS, Calnet. [Exp. #102.]

DPNet BBS. (415)788-8663. 8-N-1, 24 hrs., 300/1200/2400/9600. The Electronic Hub of Computing Professionals. Features free consultant job search service, user groups, and technical SIGs. [Exp. #101.]

Dry Bones. (415)292-7314. Formerly Nightingale. A general nursing BBS open to all: nursing/medical files, conferences echo-mail. Sysop: Jim Rankin. [Exp. #101.]

The Elfspire Tome BBS. (415)595-2387. 1200/2400/9600. A fantasy role-playing G.M. resource bulletin board featuring role-playing, games, fantasy clipart, and more. [Exp. #100.]

FAUG BBS. (415)595-2479. 8-N-1, 24 hrs., 1200/2400/9600. Amiga info and exchange. All welcome. Sysop: Rich Bremer. [Exp. #100.]

Fog City. (415)863-9697. 8-N-1. Alt. lifestyles, chat, matchmaking, CD-ROM, games, multiline. Since 1986. [Exp. #102.]

Geno's Place. (415)595-8543, 595-5844. 24 hrs. Online games, Smartnet, Intelec, RIME Biznet, SFNet, maildoors. [Exp. #102.]

Golden Gate Computer Society BBS. (415)927-1216. 24 hrs., 2400–14,400. Four lines, toll free for SF, East Bay. member of ILink & Baylink message networks. [Exp. #102.]

Graveyard Shift BBS. (415)923-9060. 8-N-1, 24 hrs., 1200/2400. Utilities, games, Windows, adult GIFs, lrg msg area, echo-mail conferences. Adult only. Small reg fee. [Exp. #101.]

Guideboard. (415)864-3858. 24 hrs., 300/1200/2400. Multiline, Cabbie's Guide to SF restaurants, doctors, auto repair, etc. Sysop: Dick Schwartz. [Exp. #102.]

IBBS West. (415)564-9998. 8-N-1, 24 hrs., 300/1200/2400/9600. IBM PC and compatibles, latest utilities, adult GIF, free trial. [Exp. #101.]

Incipits Remote. (415)324-2601. 1200–38,400. Shareware for DOS, OS/2, and UNIX. Distribution point for 386BSD PD UNIX OS. Specializes in networks, programming, and multiplatform support. Menlo Park. [Exp. #100.]

The Informer BBS. (415)468-6713, 468-9913. 24 hrs., 2400–14,440. Operations systems, tech specs, conferences, drive & controller specs, driver updates. Call back verifier. Sysop: John Custer. [Exp. #102.]

Keyhole BBS. (415)626-9419. 300/1200/2400. Oracomm node ORA486. Alt. lifestyles, adult areas, reg. required. [Exp. #101.]

Legal Information Systems. (415)331-7220. 8-N-1, 2400. Text of recent CA and CA App Cases. Reg Req. [Exp. #102.]

Lies Unlimited. (415)583-4102. 2400. Politics and polemics. NIRVANAnet. Instant access, no fee. [Exp. #102.]

Mac World BBS. (415)824-8104. 300/1200/2400. Mac/IBM files, discussion, and lots of messages. All ages welcome. Free. Sysop: Archbishop. [Exp. #100.]

Media Literacy BBS. (415)621-5156. 8-N-1, 24 hrs., 300/1200/2400. Online resources for educators and others interested in media education. Sysop: Kathleen Tyner. [Exp. #102.]

The MIDI & Multimedia Exchange BBS. (415)771-1788. .MID/.MOD & Synth Patch Libraries. [Exp. #101.]

The New Dork Sublime. (415)566-0126. 300/1200/2400/9600/14,400. Subliminal News for New Dorks everywhere. Don't die wondering… Sysop: Demented Pimiento. [Exp. #101.]

New Earth BBS. (415)878-9157. 8-N-1, 24 hrs., 1200–19,200. PCPursuitable via CAPAL & CASFA, files, national & international conferences. Free. Sysop: Romano Dikerson. [Exp. #100.]

Pacific Vision BBS. (415)324-3780. 8-N-1, 300/1200/2400. Jobs and business online, community events, discussion lounge, rent a board. [Exp. #100.]

PCjr Update BBS. (415)337-9432. 8-N-1, 300/1200/2400. IBM PCjr messages and files. Catalog and ordering PCjr equipment online. [Exp. #100.]

Reality Check. (415)567-7043. Most active message base in SF. Instant access, no fee. NIRVANAnet. [Exp. #102.]

Recovery BBS. (415)255-2188. 8-N-1, 300/1200/2400. AA, NA, Al-Anon/ACA, SLAA. Recovery and 12 Step Echos. Fido 125/9. Sysop: Rich Gorlin. [Exp. #101.]

Robotics Society Of America BBS. (415)752-7228. 24 hrs., 1200. Sysop: Rob Stevens. [Exp. #101.]

Sanctum BBS. (415)753-6861 (300–2400), 731-9859 (DS HST). Food for thought, discussion, debate, shareware, textfiles, and more. Voice validation req'd. No reg fee. [Exp. #100.]

Scubanet BBS. (415)566-0385. 8-N-1, 24 hrs., 300/1200/2400. Dedicated to the sport of free and Scuba diving, CD-ROM 500MB. Sysop: Charlie Eng. [Exp. #102.]

SF Net. (415)824-8747. Connecting SF coffee bars with the RJ11-Table. 16-line chat. Sysop: Wayne Gregori. [Exp. #100.]

Shrink Rap. (415)343-7517. 8-N-1, 24 hrs., 1200/2400. Psycho/Hypnotherapy BBS. Sysop: Martin Schaff. [Exp. #100.]

Skeptic's Board. (415)572-0359. Science and fringe science. Internet/Usenet access. San Mateo. Sysop: Rick Moen. [Exp. #100.]

SMUG (Stanford-Palo Alto Mac User Group) BBS. (415)856-0210. BBS on Threshold 2000, uses Telefinder GUI. [Exp. #101.]

Space BBS. (415)323-4193. 10 lines, Internet email, 2000 newsgroups, stocks, 50,000 files. Free downloads. Sysop: Owen Hawkins. [Exp. #101.]

StarComm BBS. (415)922-5628. 1200/2400. ANSI/ASCII support, files, doors, networking. Subscription system. Sysop: Starbuck. [Exp. #100.]

Starnet Connections Of Los Altos. (415)949-3133. 8-N-1, 24 hrs., 300/1200/2400/9600. Email, UseNet, UNIX, UUCP compilers, and more. Local to most 408 areas. Sysop: Richard Mahn. [Exp. #100.]

StrongHold BBS. (415)992-2860. 24 hrs., 300/1200/2400/9600/14,400. Online games, messages, and many useful files. Daly City. Sysop: Chris Jong. [Exp. #101.]

Symmetrics BBS. (415)382-6679. 24 hrs. Door games, useful program, and lots more. Free. [Exp. #102.]

Tomorrow's Order Of Magnitude. (415)961-9315. 2400. Call and you'll never get elected. Instant access, no fee. NIRVANAnet. [Exp. #102.]

Uncle D's Directory. (415)364-3001. 8-N-1, 24 hrs., 1200/2400/9600. Software for deaf & education, msgs, file search, classified ads, doorways. No fees. [Exp. #102.]

VA Listings. (415)744-7793. 24 hrs., 300/1200/2400. VA-owned homes for sale. Multiline. Sysop: David Piersall. [Exp. #100.]

Vid Game BBS. (415)742-6441. 2400/9600/14,400/16,800. 1.2GB, over 3800 GIFs, hundreds of music files, doors, conferences. Sysop: George Hassmer. [Exp. #100.]

The Wasteland BBS. (415)382-7916. 300/1200/2400. Online games, GIFs, and more. Sysop: Hell Raiser. [Exp. #100.]

Wetware Diversions. (415)826-0397. 8-N-1, 24 hrs., 1200/2400. Full Usenet news, Eight lines, San Francisco's Public Access UNIX System. Sysop: Eric Swason (editor@wet.UUCP). [Exp. #102.]

Whirlwind BBS. (415)726-3888. 8-N-1, 24 hrs., 300/1200/2400. The computer users BBS. All sorts of files, email, and tech help. Sysop: Chris Petrell. [Exp. #101.]

Window World BBS. (415)931-0649. 24 hrs. For people who use Windows-type software. Info., shareware, chat. Sysop: Bob Cram. [Exp. #100.]

Windows NT Online Support. (415)572-9661. 300/1200/2400/9600/14,400. MS Windows NT support, messages, files, WINNTNET. Sysop: Bruce Chester. [Exp. #102.]

Zen Connection. (415)389-9245. 1200/2400/9600. Open to all Spiritual seekers. Meditation topics, living Masters, and events. Sysop: Premananda. [Exp. #102.]

510

& The Temple Of The Screaming Electron. (510)935-5845. 38,400. A safe haven for visionaries and paranoids, 100MB, NIRVANAnet. No fee. Sysop: Jeff Hunter. [Exp. #102.]

8 Bit Apple User Group BBS. (510)294-8052. 24 hrs., 300/1200/2400. Apple II ProDOS, DOS 3.3, UL/DL, email, forums. No fees. Sysop: Noel Anklam. [Exp. #101.]

AbysS Multiline Systems. (510)482-2992, 357-1974. World Echos & Net mail, group & private chat, matchmaker. [Exp. #100.]

After Hours BBS. (510)814-9895. 8-N-1, 11 pm–6 am. 300/1200/2400. Games, Windows, GIFs, sound, graphics, msg base, email. [Exp. #100.]

AutoCAD BBS. (510)547-5264. 8-N-1, 300/1200/2400/9600. Dedicated to supporting AutoCAD. 900+ related files, message base. Files $50/year. Sysop: Robert Schutz. [Exp. #100.]

Babybrain. (510)532-6248. 24 hrs., 300/1200/2400. Politics, technology, history, the arts, text files, NorCalNet. Free. Sysop: Walter Alter. [Exp. #102.]

Bay Area OS/2 BBS. (510)657-7948. 8-N-1, 2400/9600. OS/2 files and conferences. Free. Sysop: Greg Altman. [Exp. #102.]

BayView Graphics BBS. (510)223-3763. 300–38,400. GIFs, Tomcat! mail door, BRRAnet conferences. Sysop: Bob Rider. [Exp. #100.]

The Big Board. (510)582-9364. 8-N-1, 24 hrs., 300/1200/2400. An alternative way for chubbies to meet chasers. For those without a computer, send a short message to the Sysop, who will put it on the board. Voice: (415)824-8254. Free. Sysop: Cliff Wilson. [Exp. #101.]

Breaking Walls; Building Bridges BBS. (510)827-0804. 8-N-1, 24 hrs., 300/1200/2400. Gay/Lesbians, church, AIDS, community forums, news, counseling. Sysop: Deacon DVMCC. [Exp. #100.]

Bust Out BBS. (510)881-5427. 24 hrs., 14,400. Four nodes, 2GB, huge msg and file network (including adult). Computer systems and software services. Sysop: Alex J. Riggs. [Exp. #102.]

California High-Flyers BBS. (510)568-9280. 8-N-1, 24 hrs., 300/1200/2400. Nine lines, chat, email, library. Ages 10 and up. Two subscription levels. Sysop: Carl Dominic. [Exp. #100.]

The Circuit Board. (510)487-3240. 24 hrs., 1200–14,400. 1.32GB shareware online. Political and DTP conferences. Free. Sysop: Bill Laster. [Exp. #100.]

The Clubhouse BBS, Hayward Chapter. (510)889-1932. 24 hrs., 14,400. Genealogy, WordPerfect, Lotus, dBASE, and national echos. [Exp. #102.]

Delta BBS. (510)778-3714. 24 hrs., 1200/2400. 40+ online games, new every week, msg bases, transfer section w/out ratios. Free Sysop: Phantom. [Exp. #101.]

The Diamond Mind. (510)791-0832. 8-N-1, 24 hrs., 300/1200/2400/9600/14,400. Emotional support, IBM and Mac files, Fido echos, chat, online games, adult areas. Free user level. Sysop: Diamond. [Exp. #102.]

DVPC BBS. (510)943-6238. 8-N-1, 300–14,400. [Exp. #101.]

Eastbay Online. (510)581-1543. 24 hrs., 300/1200/2400. Newest shareware, lrg library, conferences. Sysop: Mike Lopez. [Exp. #101.]

Easy Access BBS. (510)829-7627. San Ramon, Internet/Usenet/Smartnet, DOS and Windows. Subscription $4. Free access too. [Exp. #102.]

Fine Line BBS. (510)686-3051. 300/1200/2400/9600/14,400. Multi-interest, shareware, adult GIFs, and online games. Sysop: Morpheus. [Exp. #101.]

Francofolies. (510)651-3192. 1200/2400/9600. The French BBS of the Bay Area: online games, electronic newsletter, msg in French or English. No fee. Co-Sysop: MEJV. [Exp. #101.]

Fred Haney & Sons BBS. (510)792-5119. 8-N-1, 24 hrs., 2400. Software, Windows, etc., Fremont. Free. [Exp. #101.]

FrEdMail Snlndro. (510)895-1785. 1200/2400/9600. Educator/student network with Internet mail access, San Leandro HS, NorCal Hub. [Exp. #101.]

GMV-BBS. (510)294-9052. 24 hrs., 300/1200/2400. Multiline subscription BBS. Teleconference, private chat, email, SIGs, games, and file library for Amiga, IBM, Apple 8-bit, and Mac. Livermore. [Exp. #102.]

Grateful Med BBS. (510)689-0347. 8-N-1, 24 hrs., 1200/2400. Health professionals Fidonet/ADANet. Sysop: TC Dufresne. [Exp. #101.]

Hall Of Wisdom BBS. (510)540-6768. 24 hrs., 1200/2400/9600. Sciences, arts, history, engineering, and metaphysics. OS/2 support. [Exp. #102.]

IDC BBS. (510)865-7115, 814-8097. 8-N-1. Alameda, 200MB, 775+ conf areas, Qmail 4.0,

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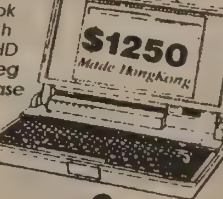

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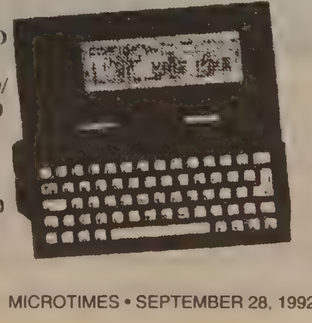

BBSes

PCBoard, ILink, RIME BizNet. Sysop: Mike King. [Exp. #102.]

IISME–Net. (510)643-6258. 300/1200/2400/9600. Initiatives for Science & Math Education, Lawrence Hall of Science, K–12net educator/student network with Internet mail access. [Exp. #101.]

The Job Xchange. (510)521-5931. 2400–14,400, 24 hrs. Computer industry jobs, resumes. TechNet. Free. [Exp. #102.]

Linkages International. (510)547-2162. 8-N-1, 24 hrs., 300/1200/2400. News, African & African American culture, science. [Exp. #100.]

The MAD Board. (510)839-7410. 14,400. Online games, TW2002, EC, GWar, and The Pit. Free, 90 min./day. [Exp. #102.]

Millennium BBS. (510)828-4153. 1200/2400. DOS shareware, games, and messages. Sysop: Terry Swiers. [Exp. #102.]

The Mines Of Moria. (510)559-9151. 1200. Role-playing games, msg bases, online games, TCH ANSI Group. [Exp. #100.]

Mutant Valley BBS. (510)294-9052. 24 hrs., 300/1200/2400. Multiline information exchange. [Exp. #102.]

The New-Ark BBS. (510)796-0947. 24 hrs., 300/1200/2400/9600. Games, Tradewar. Reg required. Sysop: Hiram Wolf. [Exp. #102.]

NightLine BBS. (510)234-1053. Home of Vetlink #22, nationwide veterans infor, supports echo conferences, over 30 veteran military persons related conferences. Free. Sysop: Jon Mankowski. [Exp. #100.]

Off Broadway's AutoCAD BBS. (510)547-5264. 8-N-1, 300/1200/2400/9600. Dedicated to supporting AutoCAD. Message base free and non-members can download one file a day. Unlimited membership, $50/yr. Sysop: Robert Schutz. [Exp. #102.]

Online Bible Reference. (510)505-9047. 1200/2400/9600. 1000+ files incl. wind, politics, religion, and news. Sysop: Jeff Price/Newark. [Exp. #100.]

The Party Wherehouse BBS. (510)256-9809 (1200/2400), (510)256-8979 (9600). 8-N-1, 24 hrs. Eight networks, over 150 message bases. [Exp. #102.]

The Phantom Zone BBS. (510)538-9586. 8-N-1, 24 hrs., 300/1200/2400. Free access. Sysop: Paul Graydon. [Exp. #102.]

Quasatron BBS. (510)846-6085. 24 hrs., 9600 V.32. IBM, electronics, two-way & amateur radio, games, adult files, etc. Telecom industry professionals welcome. Reg not required. Sysop: KC Mazie. [Exp. #100.]

Rat Head Systems. (510)524-3649. 2400. Virtual gutter for digital derelicts. Instant access. NIRVANAnet. No fee. [Exp. #102.]

Records Dept. BBS. (510)426-0470. 8-N-1, 2400. Amiga, IBM, and Mac—files, chat, Fidonet. Extras for subscribers. Sysop: Paul Tibbals. [Exp. #102.]

Sir James BBS W/ Magick Resource Center. (510)261-6567. 300–14,400. Magick, Pagan, SCA Music, Adult, MIDI, Music, Soundblaster, Windows, games. Reg req., free. Sysop: Sir James. [Exp. #102.]

Terminal One BBS. (510)432-2461. Soundblaster files, aviation and other GIFs, animation files. Wildcat 3.51, WWIV 4.21a. [Exp. #102.]

Tiger Team. (510)658-0607. Games, data encryption, PC Security and virus prevention. Firearms conference. Free. [Exp. #102.]

Trafalgar BBS. (510)735-3230. Online games, files, email, easy access. Auto-validation. Sysop: Lord Nelson. [Exp. #102.]

Viper 1 Premium BBS. (510)535-0231, 535-0315. 8-N-1, 24 hrs., 2400/9600/19,200. Multiline, 900MB, 43 download areas, large adult file areas, games, file scanning facilities online. [Exp. #101.]

Windows Online. (510)736-8343. Over 6000 Win 3.*x* & 11,000 DPS files, 5GB, 13 lines using USR-DS modems. Free trial. [Exp. #101.]

Wishing Well BBS. (510)745-7901. 24 hrs., 300/1200/2400. Email, matchmaker, files, 100+ online games. Free. Sysopette: MaryLou White. [Exp. #101.]

WizardClan. (510)376-3805, 686-6053, 525-5332. 8-N-1, 1200/2400/9600/14,400. Internet, Usenet, WWIV-Net, WWIV-Link, Fido, Adult-Net, Icenet, 100+ msg bases, games, and more. [Exp. #102.]

Worldview BBS. (510)676-2919. 8-N-1, 24 hrs., 1200–14,400. Reformed Christian perspective, files/discussion on philosophy, public policy. $49/yr. Sysop: Bill Gram-Reefer. [Exp. #102.]

707

The Black Rose. (707)557-6444. 24 hrs., 300/1200/2400. Commodore 64/128 BBS, running Image v1.2a and a NISSA Network Assoc. ANSI graphic menu, health msgs. Sysop: Captain Keelhaul. [Exp. #101.]

Dobbs Enterprises. (707)427-0277. 300/1200/2400/9600. Part of WIVInet conference. 24,000+ files. [Exp. #102.]

Recommended BBS. (707)448-2225. 24 hrs., 300/1200/2400. Multiuser games, teleconference, conversational and technical areas, 16 lines. All welcome. Sysop: Jay C. Parangalan. [Exp. #101.]

UNIX Online. (707)792-0402, 795-1721. 24 hrs., Usenet access. For UNIX, Amiga, Mac, and DOS users. [Exp. #101.]

User Friendly BBS. (707)645-8894. 8-N-1, 24 hrs., 9600. IBM/Amiga, Linet, msgs, sci-fi/fantasy info and reviews, doors. Sysop: Jim K. [Exp. #101.]

MULTI-ZONE

Fantasy Network. (408)985-1529, (408)732-4908, (415)365-7002, (415)321-3661, (415)573-1063, (415)244-9218, (415)928-4781. Online, multiuser, Interactive D&D style, fantasy adventure game. Mid-Peninsula, South Bay, North Bay, and San Mateo. [Exp. #102.]

First Online. (408)247-1717, (415)598-0398, (415)992-3780, (510)254-5455. Over 30,000 files, 4.2GB, PC-SIG library, adult files. PC and compatibles. [Exp. #102.]

Interactions BBS. (408)258-8913, (415)469-5510, (510)832-0560. 12-line chat (over 18 only), email, shareware library, two-week free trial. Sysop: C. Watson. [Exp. #102.]

Public Domain Software Exchange. (415)571-6911, (707)444-9203. 8-N-1, 24 hrs., 1200/2400. Multiple message areas, large file library, chat, two lines. [Exp. #100.]

ASSOCIATIONS

American Association For Artificial Intelligence (AAAI). Call: (415)328-3123. Email: membership@aaai.org. [Exp. #100.]

The Association For Worldwide Software Support Management. Meetings: 2nd Tues., Milpitas Sheraton. Call: Mikael Blaisdell, (415)865-1323. [Exp. #105.]

Association Of Database Developers (ADD). Meetings: 2nd Thurs., 7:00 pm, The Gatehouse, Fort Mason Center, San Francisco. Organization for professional xBASE language systems developers. Membership $50/yr or $5/meeting. Call: JoAnn, (415)863-6706. [Exp. #101.]

ASSOCIATIONS

The Black Data Processing Associates, Silicon Valley Chapter. Meetings: 4th Thurs., 6:30 pm, Amdahl Corp., Sunnyvale. Call: Doug Jones, (408)737-5999. [Exp. #101.]

Computer Professionals For Social Responsibility. Meetings: 2nd Wed., 7:30 pm, UC Berkeley, Evans Hall, Rm. 608-7. Call: Judy Stern, (510)643-7499. [Exp. #105.]

Data Processing Management Association. Call: (415)978-0868. [Exp. #105.]

IEEE Computer Society, San Francisco Chapter. Meetings: 3rd Wed. Call: (415)905-4400. [Exp. #103.]

Independent Computer Consultants Association, Northern California Chapter. Meetings are open to all. Only national trade assoc. comprising non-aligned working computer professional with in-the-trenches experience. Call: ICCA, (415)441-2948. [Exp. #102.]

International Network Of Women In Technology. Dedicated to significantly increasing the leadership of Women in Technology in industry and government. Call: Dr. Carolyn Turybfill, (415)336-1007. Email: Carolyn Turybfill@Eng.Sun.COM. [Exp. #100.]

Networkers' Toastmasters. Meetings: Every Tues., noon–1:00 pm, 2560 N. First St., San Jose. Call: Mona Kellem, (408)534-1255. [Exp. #101.]

North Bay Systems Professionals. Meetings: 3rd Wed., 7:00 pm, Holiday Inn, Terra Linda, 1010 Northgate Dr., San Rafael. NBSP provides a forum and network for systems professionals. Call: Harry Chapman, (415)291-0174. [Exp. #101.]

Robotics Society Of America. Meetings: 2nd Mon., 8:00 pm, Exploratorium Library, San Francisco. Call: Brad Smallridge, (415)550-0588. [Exp. #101.]

Society For Technical Communication, Berkeley Chapter. Meetings: 2nd Wed., 6:00 pm, Yenching Restaurant, 2017 Shattuck Ave., Berkeley. Call: Rich Julius, (415)837-0397. [Exp #102.]

Society For Technical Communication, San Francisco Chapter. Meetings: 3rd Wed. Call: (415)985-7121. [Exp. #103.]

Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219. [Exp. #102.]

United Sysops Association. Meetings: 2nd Wed., 7:00 pm, Coco's, 1035 S. Mary Ave., Sunnyvale. Organization of bulletin board sysops and users. Call: Bill Strouse, (408)739-9081. BBS: (408)739-8753. [Exp. #105.]

USER GROUPS

ACCOUNTMATE

AccountMate User Group. Meetings: 3rd Tues., 7:00 pm, S. Branch Berkeley Library, 1901 Russell St. Call: Joshua, 1-800-310-0262. [Exp. #104.]

ACCOUNTING SOFTWARE

Computer Associates User Group. Meetings: 1st month of quarter on 3rd Wednesdays. Holiday Inn, 1500 Van Ness. Come share ideas and information with other local users of Computer Associates Accounting Software! Call: Beth E. Markus, (415)864-6770. [Exp. #100.]

AMIGA

3rd Dimension—Imagine/Lightwave User Group. Meetings: 1st & 3rd Mon., Computer Showcase, 2739 Geary Blvd., SF. Call: Ollie, (415)863-8792. [Exp. #102.]

AAA—Amiga Addicts Anonymous. Meetings: 3rd Tues., Concord Water District Bldg., 1311 Concord Ave. Classes, BBS, pub. dom. disks, info line. Call: (510)935-0829. [Exp. #100.]

ACCESS—Amiga & Commodore Computer Enthusiasts Society. Meetings: 2nd Thurs., 7:00 pm, Livermore Airport Terminal. Call: Paul, (510)829-6053. [Exp. #102.]

ALF—Amiga Learners Forum. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Beginners group. Call: (408)262-9334. [Exp. #100.]

Amiga User Group—Germany. German Amiga user group is seeking contacts in the US. Contact: Nils Wietelmann, Unter den Heestern 28, W-2839 Kirchdorf, Germany. [Exp. #102.]

AUM—Amiga Users Of Marin. Meetings: 3rd Wed., 7:30 pm, College of Marin Science Center, Rm. 190. Beginners class at 6:00 pm. Call: (415)456-1411. BBS: (415)485-5895. [Exp. #105.]

AWEST Amiga Users. Meetings: 1st Wed., 7:00 pm, Computer Showcase, 2739 Geary, SF. Call: (415)584-8406. [Exp. #103.]

FAUG—First Amiga User Group. Meetings: 1st Tues., 7:00 pm, HT Electronics, 275 N. Matilda Ave., Sunnyvale. Call: Mike Fisher, (415)855-9426, BBS (415)595-2479. [Exp. #100.]

Redwood Empire Amiga. Meetings: 3rd Tues., 7:30 pm, Santa Rosa Plaza, Community Room. SIGs meet throughout month. Call: (707)523-9978. BBS: (707)795-2717. [Exp. #104.]

TOGA—The Other Group Of Amigoids. Meetings: Varying Sat., 12:30 pm, Milpitas Library, 40 N. Milpitas Blvd. Call: Lawrence Brown, (408)984-6036. [Exp. #104.]

APL

APL Bay Area User Group. Meetings: 2nd Mon., 7:00 pm. Call: Tibor Horvath, (415)283-5611. [Exp. #100.]

APPLE

Tri-Valley Apple II User Group. Meetings: 1st Wed., 7:00 pm, Glendale Federal Bank, 3101 Crow Canyon Place, San Ramon. Come and learn more about your computer. Support II+, IIc, IIe, IIgs. Call: (510)828-0959. [Exp. #105.]

AT&T

AT&T Computer User Group, North Bay. Meetings: 1st Wed., informal discussion at 6:00 pm, program begins at 7:00 pm, San Francisco AT&T Bldg., 50 Fremont St. MS-DOS and UNIX. Call: Jim Lansing, (415)885-6631 or Joe Mahoney, (415)584-6510; BBS (415)829-6027. [Exp. #105.]

AT&T Computer User Group, South Bay. Meetings: 2nd Wed., informal discussion at 6:00 pm, program begins at 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. MS-DOS and UNIX Call: Joe Lipsig, (408)733-6522; BBS (408)946-7734. [Exp. #105.]

AT&T UNIX Computer User Group, South Bay. Meetings: 4th Wed., new user education at 6:30 pm, program begins at 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Thad Floryan, (408)985-7100; USENET, thad@cup.-portal.com. [Exp. #105.]

ATARI

ABACUS (Atari Bay Area Users Society). Meetings: 1st Sat. San Francisco. Call: (415)469-7924. [Exp. #102.]

BAAUG (Bay Area Atari Users Group). Meetings: 1st Mon., 7:00 pm, Agnews Aud., Santa Clara. Call: Andres Barbiero, (408)9803-9787. BBS: (408)986-0215. [Exp. #105.]

BASIC

SF Bay Area Visual BASIC User Group. Call: Gustavo Eydelteyn, (510)547-7295. [Exp. #104.]

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USER GROUPS

Software User Group. Meetings: 3rd Wed., 6:30 pm. All CAD users welcome. Call: Michael Foley, (510)734-0707. [Exp. #103.]

COMMODORE

64/More CUG, Cupertino Chapter. Meetings: 3rd Sun., 6:00 pm. Cupertino Library. Call: (408)262-9334. [Exp. #100.]

64/More CUG, North Valley Chapter. Meetings: 2nd Sat., 10:00 am. Milpitas Library. Call: (408)262-9334. [Exp. #100.]

ACCESS—Amiga & Commodore Computer Enthusiasts Society. Meetings: 2nd Thurs., 7:00 pm, Livermore Airport Terminal. Call: Paul, (510)829-6053. [Exp. #102.]

CAVE—Commodore Amiga Video Enthusiasts. Meetings: Every other Sat., 8:00 pm, 304 Springs St., Old Suisun. Call: Ron, (707)421-2283. [Exp. #101.]

Commodore Hayward User Group. Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park. (510)793-2514. [Exp. #101.]

CP/M

San Francisco Computer Society. Meetings: 7:00 pm, Laguna Honda School, 1350 7th Ave., San Francisco. Call: Ralph Gallegher, (415)929-0252. [Exp. #101.]

DBASE

ADD dBASE Software SIG. Meetings: 3rd Tues, 7:30 pm, Fort Mason Center, San Francisco. Led by Miriam Liskin. Call: JoAnn, (415)863-6706. [Exp. #101.]

ADD Fox Software SIG. Meetings: 1st Thurs., 7:00 pm, Fort Mason Center, San Francisco. Call: JoAnn, (415)863-6706. [Exp. #101.]

East Bay Database User Group. Meetings: 3rd Sun., 1:30 pm, 2415 Grant St., Berkeley. Call: David Chilcott, (510)653-1303. [Exp. #101.]

DESKTOP PUBLISHING

Bay Area Desktop Publishing User Group. Meetings 1st Wed., 7:00 pm, Nisha Software, 2493 Telegraph Ave., Berkeley. Topics include editing and publishing as a career. Call: (510)848-8200. [Exp. #103.]

Golden Gate Computer Society DTP SIG. Meetings: 3rd Thurs., 7:00 pm, Conference Room, Bay Area Training facilities, 4340 Redwood Highway, Suite 138-F, San Rafael. Call: (415)485-1871. [Exp. #105.]

FREEDOM, PRIVACY, AND TECHNOLOGY

BMUG SIG On Freedom, Privacy, And Technology. Meetings: Last Sun., 2:00 pm, BMUG office, 2055 Center St., Berkeley. Call: Judi Clark, (510)549-2684. [Exp. #104.]

IBM AND COMPATIBLES

Berkeley PC User Group. Meetings: 2nd Mon., 7:00 pm, Winners Circle Systems, 2618 Telegraph Ave., Berkeley. Presentations followed by discussion, PD library, newsletter, Geo Ensemble SIG. Call: Mel Mann, (510)526-4033. [Exp. #101.]

Delta PC Users Group. Meetings: 3rd Sat., 10:00 am. Call: (510)427-2255, ext. 744. [Exp. #101.]

DVPC—Diablo Valley User Group. Meetings: 1st Thurs., 7:30 pm. SIGs include WordPerfect, Windows, Paradox, Beginner's, Visual Basic, education/entertainment, and new users. Call: (510)943-1367. [Exp. #105.]

EastBay FOG. Meetings: 2nd Wed., 7:30 pm, episcopal Church of St. John-in-Montclair, 1707 Gouldin Rd., Montclair. All microcomputers, MS-DOS, CP/M. Call: (510)653-2627. [Exp. #105.]

EPIC—EastBay PC IBM Computer Club. Meetings: 2nd Tues., 7:00 pm, Milpitas Library, 40 N. Milipitas Blvd. Beginners welcome. [Exp. #100.]

Golden Gate Computer Society (GGCS). Meetings: 4th Mon. 7:30 pm, San Rafael Community Center. Free intro to computers class at 6:00 pm. Call: (415)927-2909. [Exp. #102.]

IBM Technical SIG. Meetings: 2nd Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Rm. H-1, Palo Alto. Sponsored by Software Entrepreneurs' Forum. Call: Peter Harris, (415)329-1880. [Exp. #104.]

Micromate–CP/M–DOS Users Group. Meetings: 1st Thurs., 7:30 pm, Eclectic computer buffs. Chabot Observatory, 4917 Mountain Blvd., Oakland. Call: Ed Miller, (510)376-1611. [Exp. #105.]

NBUG—North Bay User Group. Meetings: 2nd Thurs., 7:30 pm, 330 Rogers St., Vallejo. All computer users welcome. Call: (707)644-9327. BBS: (707)643-NBUG. [Exp. #100.]

PC BasicS: Silicon Valley Computer Society SIG. Meetings: 3rd Mon., 7:30 pm, 847 W. Maude Ave., Sunnyvale. Talks presented by Rich Wingerter of Zip Consulting & Design. Call: (415)326-2435. [Exp. #101.]

Peninsula Computer Club. Meetings: 2nd Thurs., 7:30 pm, Social Room, 222 Laurel St., San Carlos. DOS and CP/M libraries. Call: Larry Welling, (415)593-9981. BBS (415)571-9259. [Exp. #104.]

San Francisco Business Computers. Meetings: 4th Tues., 5:30 pm. For those who use computers in business. Visitors $5. Call: (415)788-5338. [Exp. #105.]

San Francisco PC Users Group. Meetings: 3rd Tues., 6:15 pm, Conference Center, Bldg. A, Fort Mason. Call: (415)979-5879. [Exp. #105.]

Stanford/Palo Alto PC User Group. Meetings: Last Wed., Turing Aud., Stanford. DOS/Windows. Call: (415)329-8252. [Exp. #103.]

KNOWLEDGEMAN

Bay Area KnowledgeMan (And Guru) User Group. Meetings: 1st Tues., 6:30 pm., JNZ, Inc., 826 Las Trampas Rd., Lafayette. A forum for discussion and info concerning mdbs products, esp. KnowledgeMan and Guru. Call: (510)947-4878. [Exp. #101.]

LAPTOPS

HPX HP Laptops & Handhelds. Meetings: 2nd Sat., 10:30 am, Sunnyvale. Call: Michael Felsenstein, (415)564-8279. [Exp. #100.]

Legal

SF Bar Assoc. WordPerfect User Group. Meetings: 3rd Wed., noon, Brown bag meetings. SF Bar Assoc. Boardroom, 7th Fl., 685 Market St. Call: (415)421-5650. [Exp. #105.]

MACINTOSH

A32 Macintosh User Group. Meetings: 2nd Sat., 10:00 am, GTE Cafeteria, 100 Ferguson Dr., Mountain View. Call: (408)263-0398 days. [Exp. #103.]

BMUG—Berkeley Macintosh User Group. Meetings: Every Thurs., 6:00 pm, Physical Sciences Lecture Hall, UC Berkeley Campus. Call: (510)549-BMUG. [Exp. #101.]

BMUG West. Meetings: Last Mon., 6:30 pm, San Francisco Exploratorium. Call: (510)549-BMUG. [Exp. #101.]

International Macintosh Users Group (IMUG). Meetings: 3rd Thurs., 6:45 pm, location varies. A forum for multilingual computing. Call: Roger Sherman, (415)859-5146. [Exp. #105.]

Let's Go Macintosh Computer Society. Meetings: 3rd Thurs., 7:00 pm, Skyline Jr. College, Media Center, Rm. 2105, San Bruno. See and try interesting new products, meet other Mac users, hear guest speakers. Call: Fidel Cajulao, (415)221-2995, or Nolan Apostle, (510)947-2523. [Exp. #103.]

Macintosh SIG. Meetings: 3rd Tues., 7:00 pm, Apple Cafeteria, City Center 4, De Anza and Rodrigues, Cupertino. Sponsored by Software Entrepreneurs' Forum. Call: Jeff Cherniss, (408)999-2524. [Exp. #104.]

Macintosh SIG Of Programming And Interfacing Enthusiasts. Meetings: 2nd Thurs., Lynbrook High School, Rm. 33. Call: George Ingalls, (408)243-0234. Write: PO Box 2185, Santa Clara, CA 95055. [Exp. #105.]

Macs Of Marin. Meetings: 2nd Thurs., 7:00 pm, Redwood High School, Larkspur. Marin County Mac User Group for all levels of expertise, beginners welcome, SIGs. [Exp. #102.]

SPC Apple User Group. Meetings: 2nd Wed., 7:30 pm, Fremont Main Public Library. The Society for Prevention of Cruelty to Apple Computers Users Group supports all Apple and Macintosh computers. Call: Jim Weil, (415)796-7169. [Exp. #105.]

Women's Macintosh User Group. Meetings: 2nd Tues., 7:00 pm, ComputerWare, Palo Alto. Call: Buffy Joseph, (415)792-2840 or Tayna Halepota, (415)949-3936. [Exp. #100.]

MULTIMEDIA

BMUG Multimedia SIG. Meetings: 2nd Mon., 6:00 pm, Call: (510)549-BMUG. [Exp. #100.]

International Interactive Communications Society—IICS. Meetings: 2nd Tues., 7:30 pm. Annual dues: $500 corporate members, $74 individuals, and $40 students. Nonmembers pay $10 per meeting. Call: IICS Hotline, (415)328-7318. [Exp. #105.]

Multimedia SIG. Meetings: 1st Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Palo Alto, Rm. H-1. SIG of Software Entrepreneurs' Forum. Call: Valerie Taylor, (415)424-9051. [Exp. #104.]

Multimedia User Group. Meetings: 1st Wed., 7:00 pm, 600 Townsend St., 1st Fl., San Francisco. A forum to learn about the multimedia industry, get your questions answered, and meet with fellow professionals. Sponsored in part by Proxima and Mitsubishi. [Exp. #102.]

NETWORKING

NetSIG. Meetings: 4th Tues., 7:00 pm, Novell Sunnyvale. Networking SIG for Software Developers. SEF group. Call: Skip Addison, (408)277-5867. [Exp. #105.]

NEXT

BANG—Bay Area NeXT Group. Meetings: 3rd Wed., 7:00 pm, Terman Aud., Stanford. Presentations and lectures. Call: (415)327-BANG. Email: info@BANG.org. [Exp. #102.]

Berkeley NeXT Users Group. Meetings: 2nd Tues., 7:00 pm, 2055 Center St., Berkeley. Call: Bernt Wahl, (510)644-0139. [Exp. #101.]

NOVELL

Silicon Valley Novell User Group. Meetings: 3rd Wed., 6:30 pm, Coco's, 1305 S. Mary Ave., Sunnyvale. Call: Bill Strouse, (408)739-9081. BBS: (408)739-8753. [Exp. #104.]

OMNIS 7

GUIdata Bay Area Omnis 7 User Group. Meetings: 1st Mon. Newsletter, forum for all users. Call: Peter Bennett, (510)935-5203. [Exp. #101.]

OS/2

OS/2 Bay Area User Group. Meetings: 4th Mon., 7:00 pm. For anyone interested in OS/2. Presentations, product demos, questions and answers. Call: (415)755-3124. [Exp. #105.]

PEN COMPUTING

Pen Systems SIG. Meetings: 4th Wed., 7:00 pm, Cubberley Community Center, Rm. H-1, 400 Middlefield Rd., Palo Alto. SIG of Software Entrepreneurs' Forum. Addresses all issues of interest for developers of pen computing software. Call: Bill McApline, (415)348-2257 or SEF at (415)854-7219. [Exp. #101.]

PROJECT MANAGEMENT

Microsoft Project User Group. Meetings: 3rd Mon., 6:30 pm, TEK/LINK Corp., 2901 Tasman Dr., Suite 207, Santa Clara. Project management solutions with Microsoft Project software—both PC and Mac. Call: Henry Viveiros, (408)293-5201. [Exp. #101.]

Q&A

East Bay Q&A User Group. Meetings: 4th Tues., 7:00 pm, San Leandro. Developing and expanding the many uses of Q&A database/word processor program by Symantec. Call: (510)475-8062. [Exp. #102.]

West Bay Q&A User Group. Meetings: 2nd Tues., 7:00 pm, Redwood City. Developing and expanding the many uses of Q&A database/word processor

Continued on page 296

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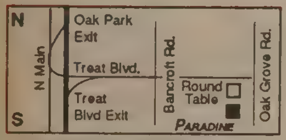

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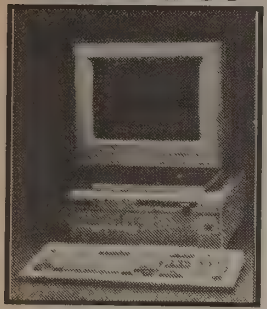

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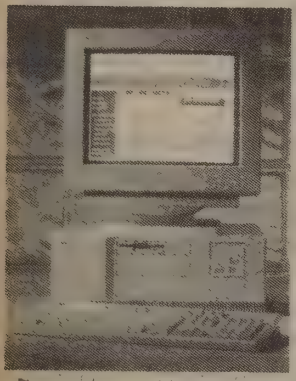

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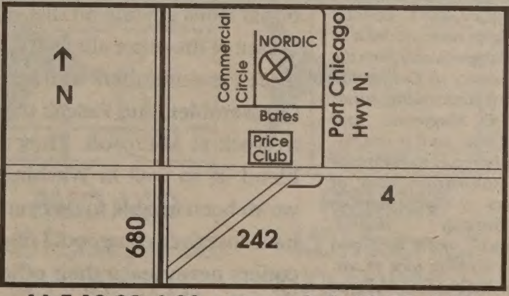

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Aliens, Abductions, Software, Windows, And You

Or Why I Never Get Asked To Speak At UFO Conventions

BY JOHN C. DVORAK

I knew my luck had run out when the little geeks showed up at the front door. You know, those bug-eyed, skinny, weird, alien goofballs who abduct people left and right while the government does nothing, *nothing*!

So I opened the door and was confronted by three of the brownish green, black-eyed bipeds. Unable to talk well in the nitrogen/oxygen air mixture we have here on earth, they instead point and grunt a lot. They grunted as they walked in the front door. I looked outside to see an eerie green light. The cars on the freeway were moving slow, and the two across-the-street neighbors were frozen solid by some sort of ray. Nobody ever sees these aliens except the unfortunate few who are "contacted" by them for one reason or other.

DVORAK'S LAST COLUMN

In no time, we were off in the alien space ship, chatting in the argon/xenon/oxygen air which made their voice boxes function properly. Since most abductions are against the will of the participants, few have reported on the aliens' voices. Just for the record, they all sound like Bing Crosby!

I was rushed into the Captain's quarters, where four bug-eyed aliens were leaning over a 486 clone. The Captain motioned me over.

He pointed at the monitor. "This damned Windows program keeps crashing. We're having nothing but problems. Can you fix it?"

Oh, brother, I thought to myself, Intergalactic Ask Dvorak. "What applications are you running?"

"You know, Lotus, Word Perfect, stuff like that." He shrugged his shoulders.

"Can't you guys write your own applications? Does anyone on this vessel code?"

One of the other aliens spoke up. "We had three crew members who learned to code in C, assembler, and Pascal; they jumped ship to work at Microsoft. They've managed to blend in so well in Washington State that we've been unable to recover them. We may have lost them for good. I understand many coders never leave their offices for days up there."

© 1992 by John C. Dvorak. All rights reserved. John C. Dvorak graduated from the University of California. He is a contributing editor of PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

I was just about to comment when the entire ship shook violently tossing everyone around the room.

A huge viewing screen dropped from the ceiling as things settled down. On it appeared a weird, block-headed, pink-faced alien, the likes of which I'd never seen.

He spoke in a loud, demanding voice. "We have locked on to your ship. You have Dvorak. Send him to us or we will board your ship and destroy you."

The Captain rose to his feet. "Threats mean nothing to us! But you can have Dvorak."

Before I knew it, the other three guys were hustling me into the corridor in a big hurry. There a doorway opened, leading to the other spacecraft. Next thing I knew, I was doing a two-foot slide on a slick, black metallic floor in a large room, sliding to a stop in front of three block-headed, multicolored aliens. Looking like rejects from that screwy razor ad where the guy has a cubic head, the aliens were huddled around a PC clone. The one whose face I saw on the screen spoke first. "We can't get OS/2 installed. It dies for no good reason."

"What the heck machine are you installing it on?"

The guy look depressed. "Golly, Mr. Dvorak, I really don't know."

I realized that I couldn't get too angry with these characters since I'd probably have to get a ride home from them. "Can I ask you if you can get me back to my house in California?"

A short green-colored blockhead popped in front of me. "Do you have to be home this century?" He burst out laughing.

"What?!"

"Don't listen to him. He's a joker," said the pinkhead. "Is there anything we can do about this gear?"

"Have you guys thought about buying some new stuff? OS/2 requires new equipment, not this old crap. There are a lot of stores in California where you can get this stuff cheap. What are you going to use the machines for?"

"We are going to use them to plan the destruction of Western Civilization on your earth!"

"What? How?"

"By helping to elect a Democratic President and a Democratic Congress!!" His face lit up as the little green guy pounded out a rimshot in the corner where a set of drums mysteriously appeared. They all laughed and a large jack-in-the-box popped out of the PC clone.

They all laughed again. "Cheer up, Dvorak, we just invited you over to tell you we enjoy your writings. There are aliens other than the bug-folk, who get all the publicity. Maybe you could write about us someday.

"And, as for the OS/2 thing. We're Mac users! We were just joking. Hahahaha. Ready to beam back home?"

I was flabbergasted. Just as I was about to say yes, I was struck in the face by a cream pie. I heard laughing in the background just as a buzzing sound began.

Before I knew what was happening I was back in my living room, still covered with pie cream. Somehow my right shoe was balanced on the top of my head. It fell to the floor and I put it on my foot and went to the kitchen to rinse off the goo. I looked out the window, and the ship containing the practical jokers was hovering over my neighbor's house, sending a beam down to sting the neighbor's dog, who jumped around flinching and barking at the vessel.

The blue-faced alien appeared behind me with a little whisk broom and brushed my back. "I'm terribly sorry about our penchant for joking around," he said. "We just do it naturally. We love to disrupt things. It's great fun.

"So where do you recommend we find a good computer store?"

I thought for a moment. "You guys get around pretty fast. Let me get a map and show you the town to look for computers." I pulled out a map. "Here. Redmond, Washington. Great town. Spend some time there."

"Great! Thanks. We will." He rolled up the map and pocketed it. He was about to signal his return when I stopped him.

"Oh, and if you see a couple of bug-eyed aliens, tell them to call home."

The alien laughed. The ship left. A week later I heard Windows NT was delayed and three programmers had left. ■

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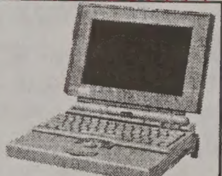

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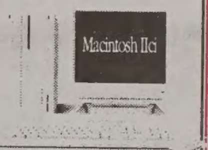

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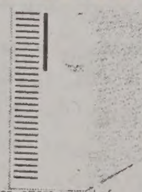

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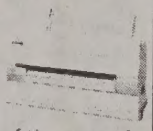

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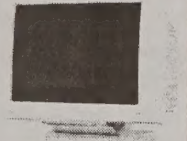

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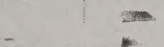

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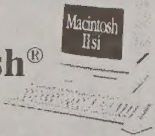

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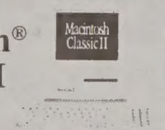

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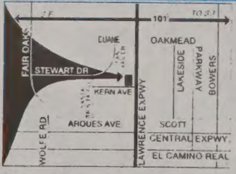

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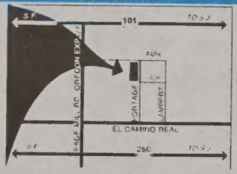

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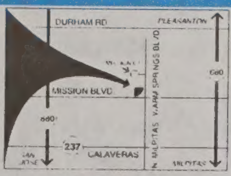

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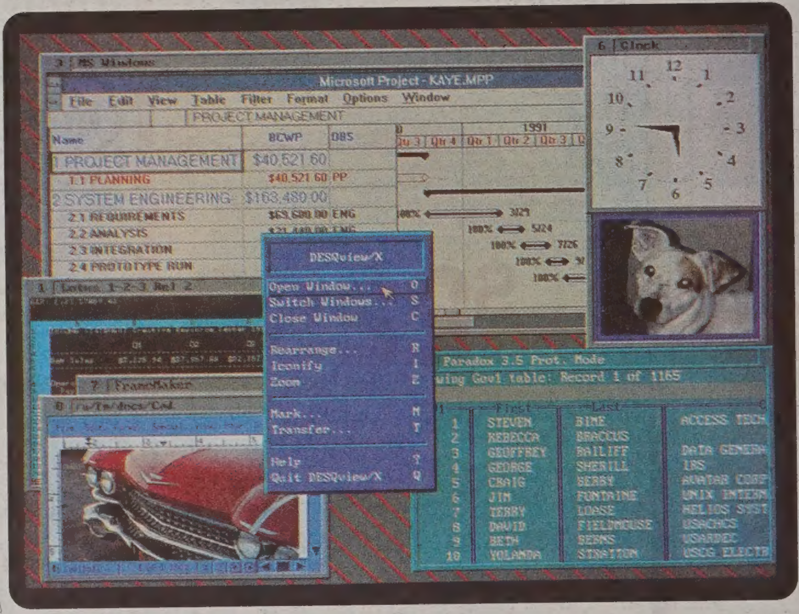

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